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THURSDAY, MARCH 23, 1961

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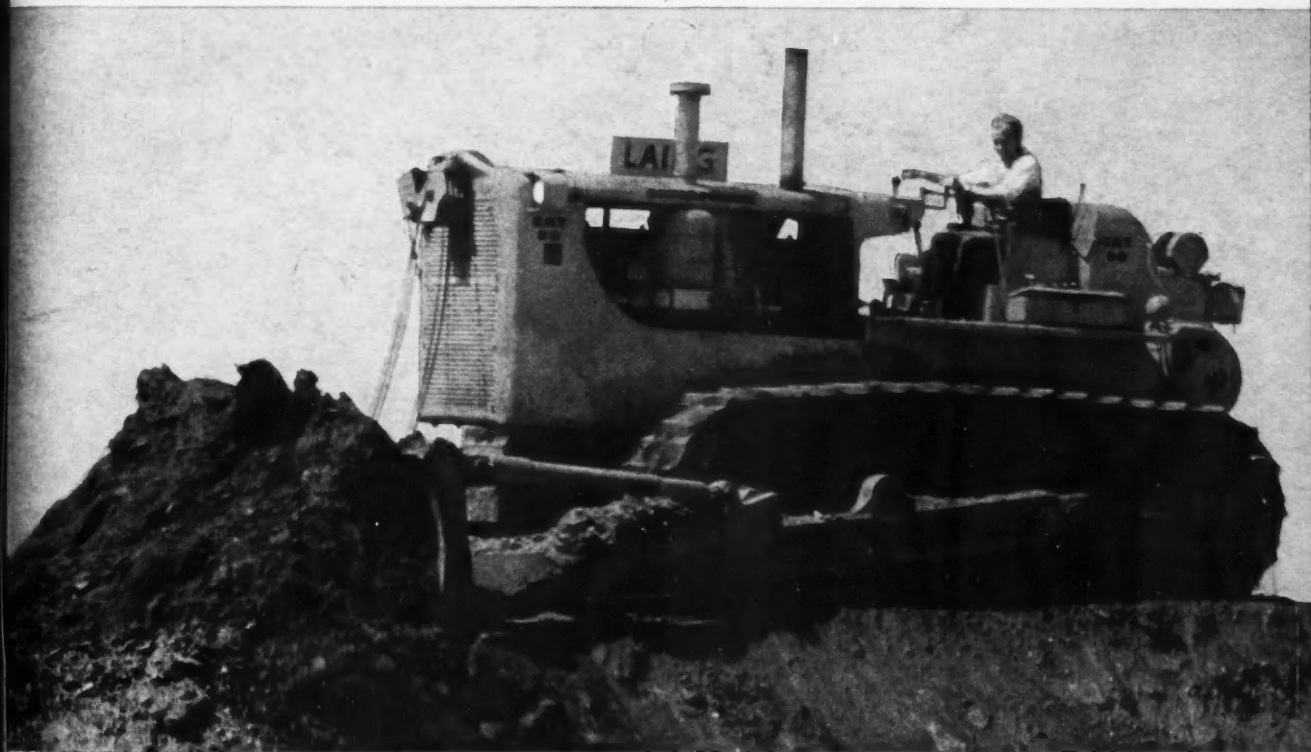
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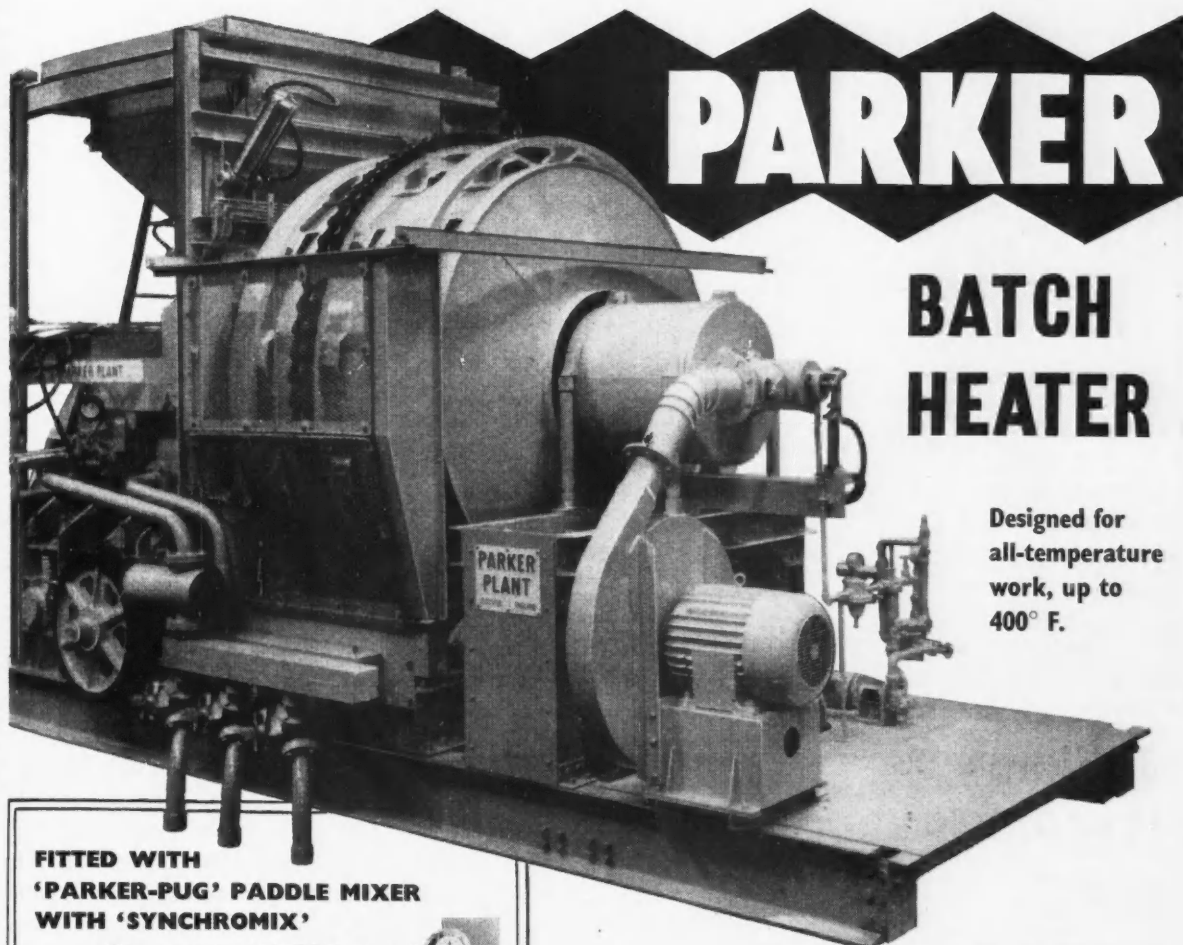
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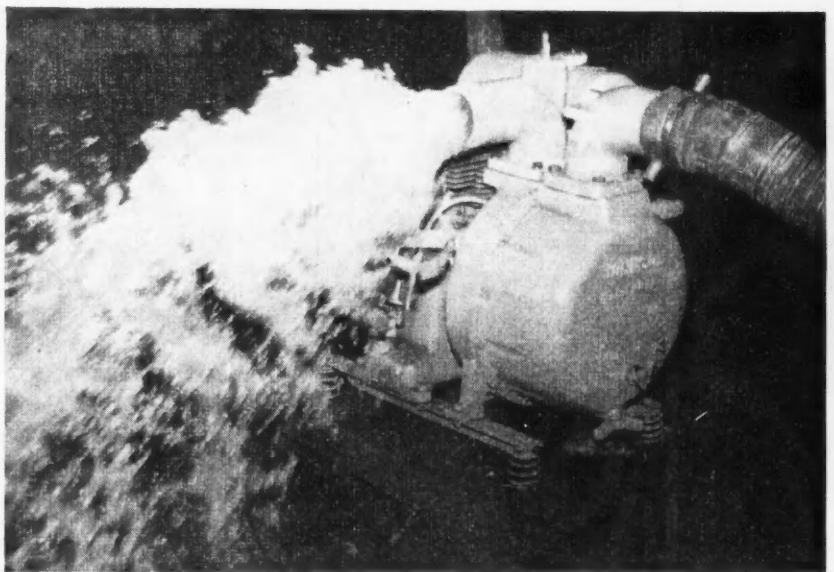
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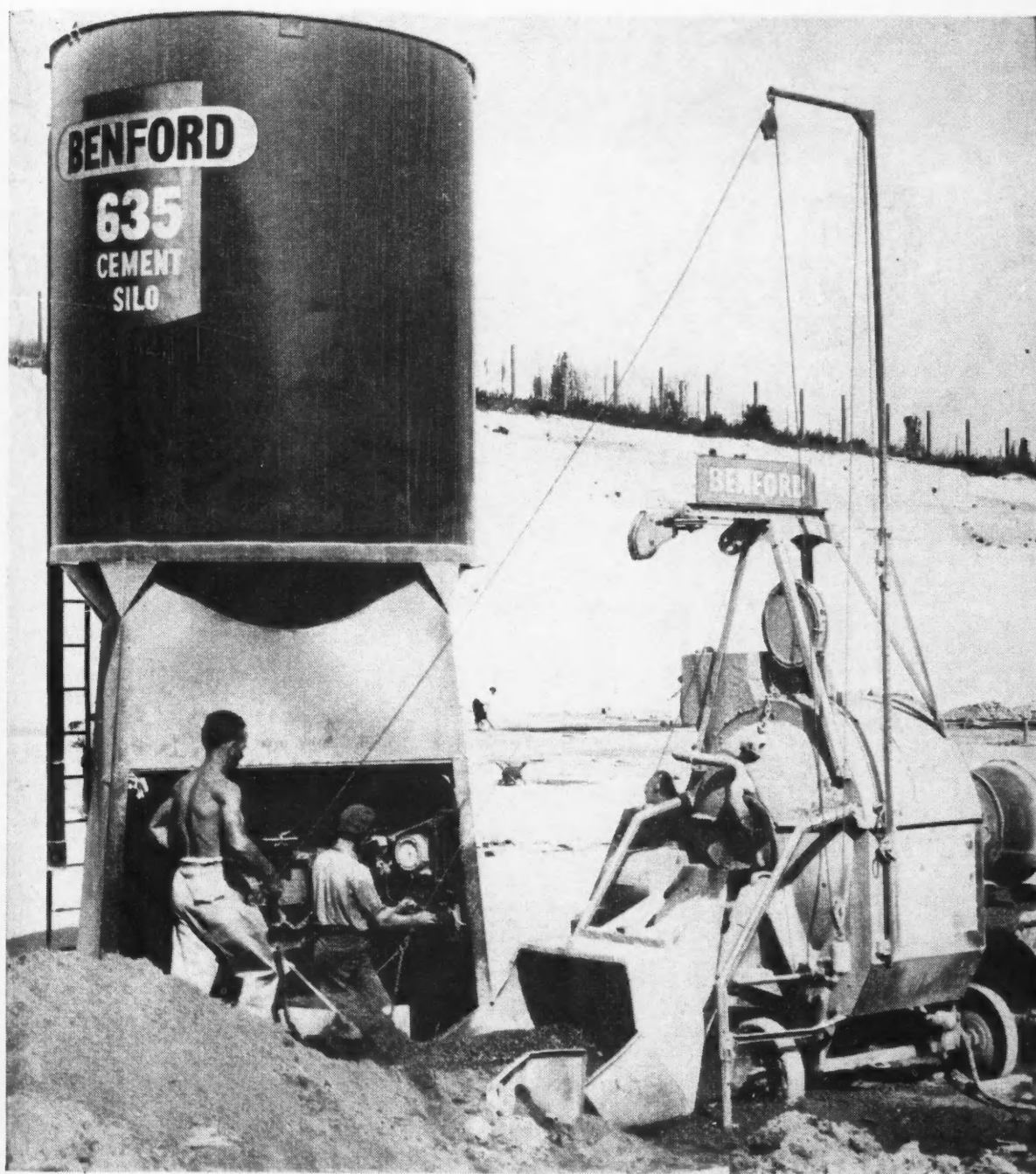
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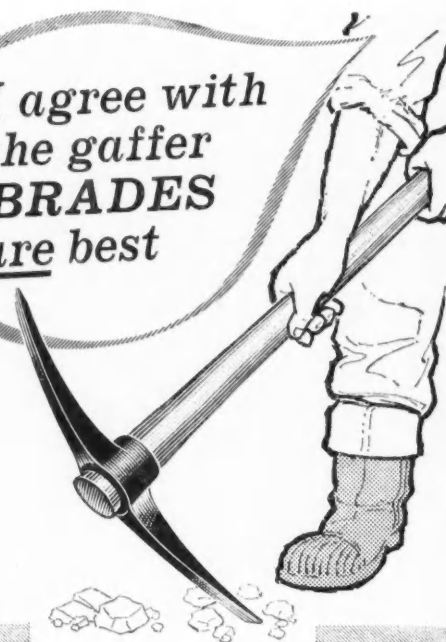
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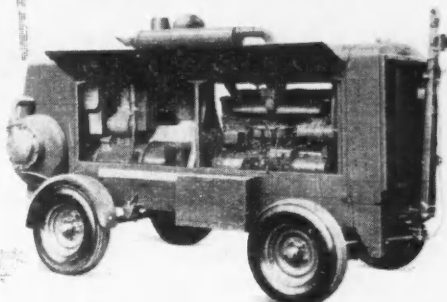


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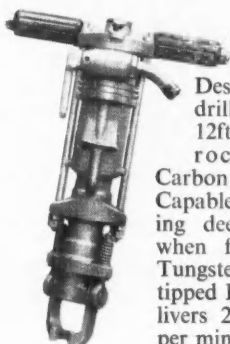
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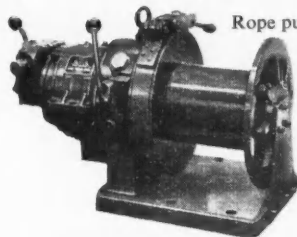
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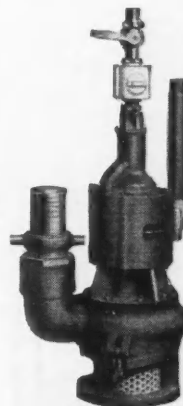
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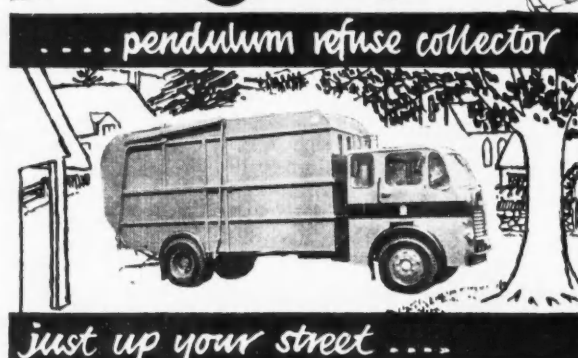
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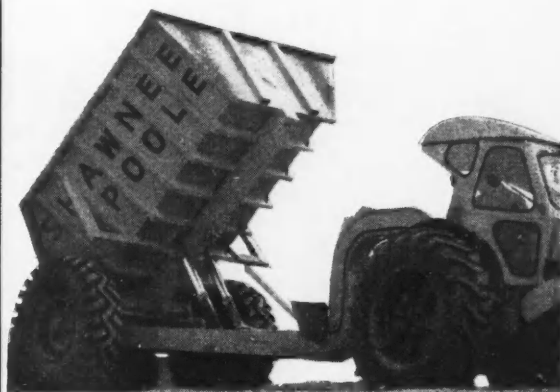
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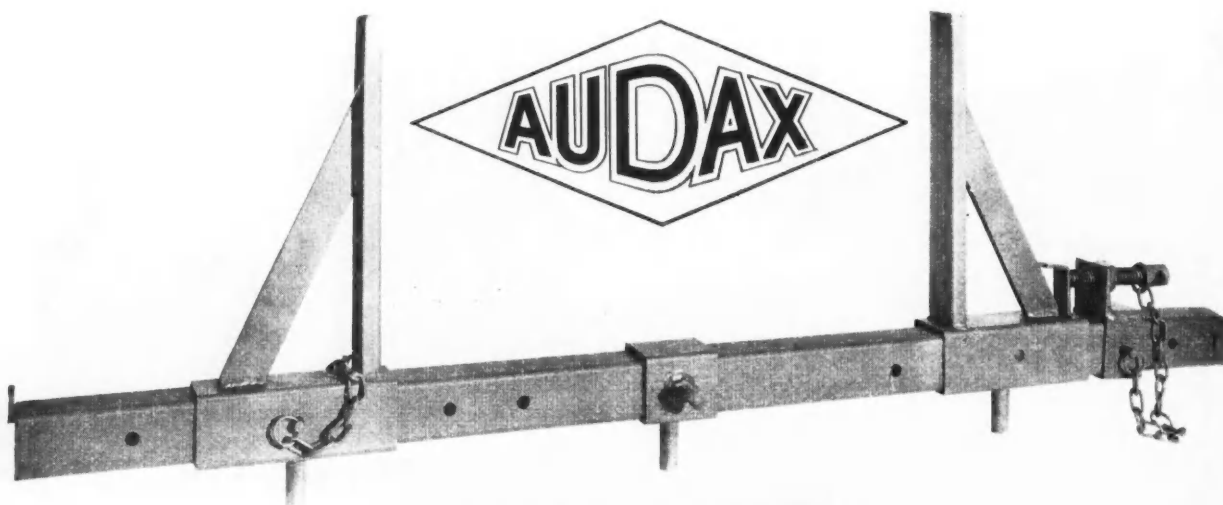
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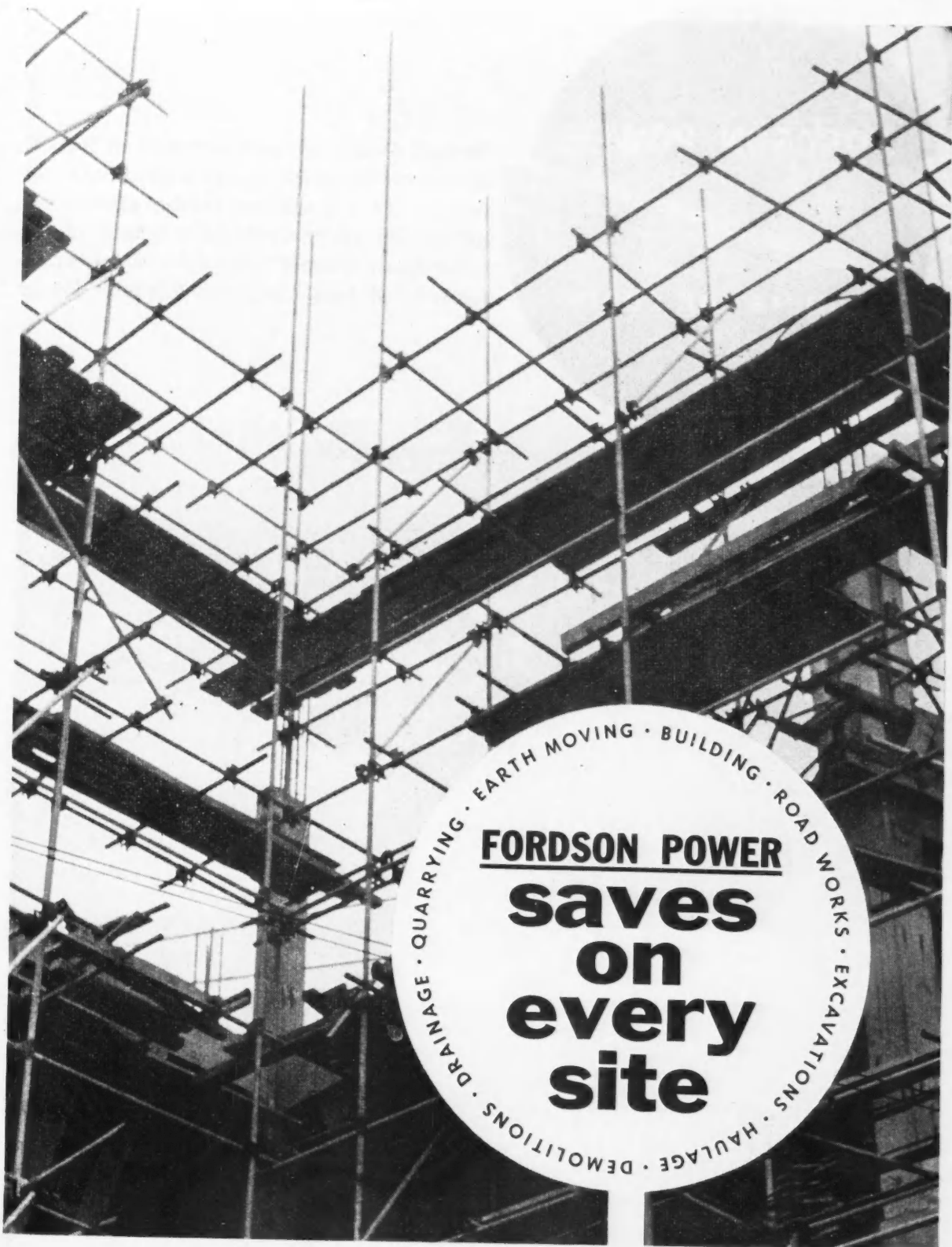
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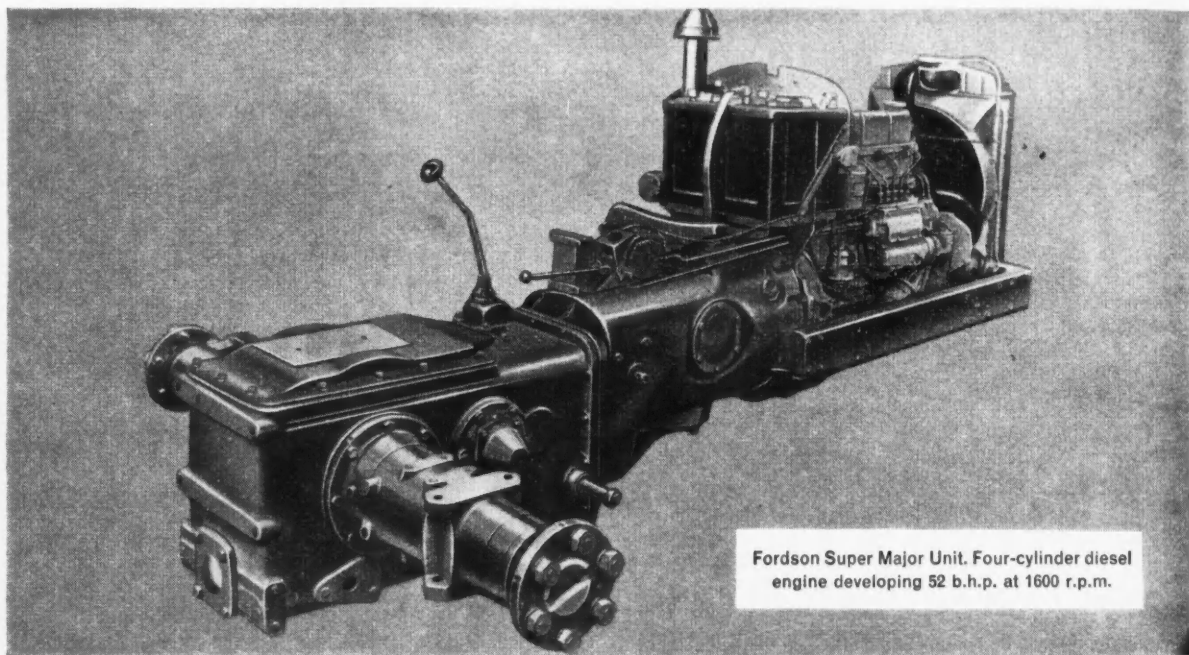
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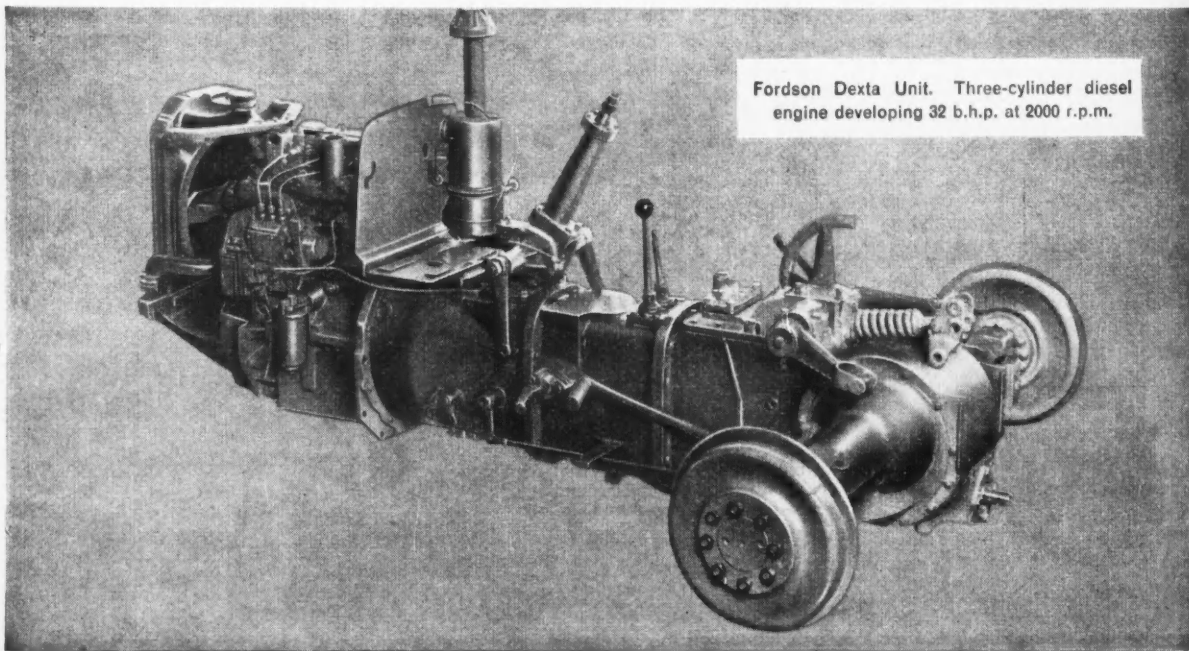


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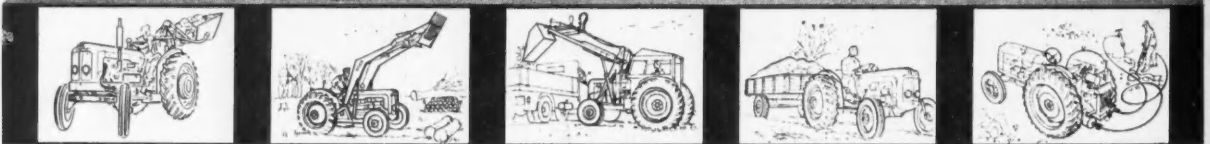
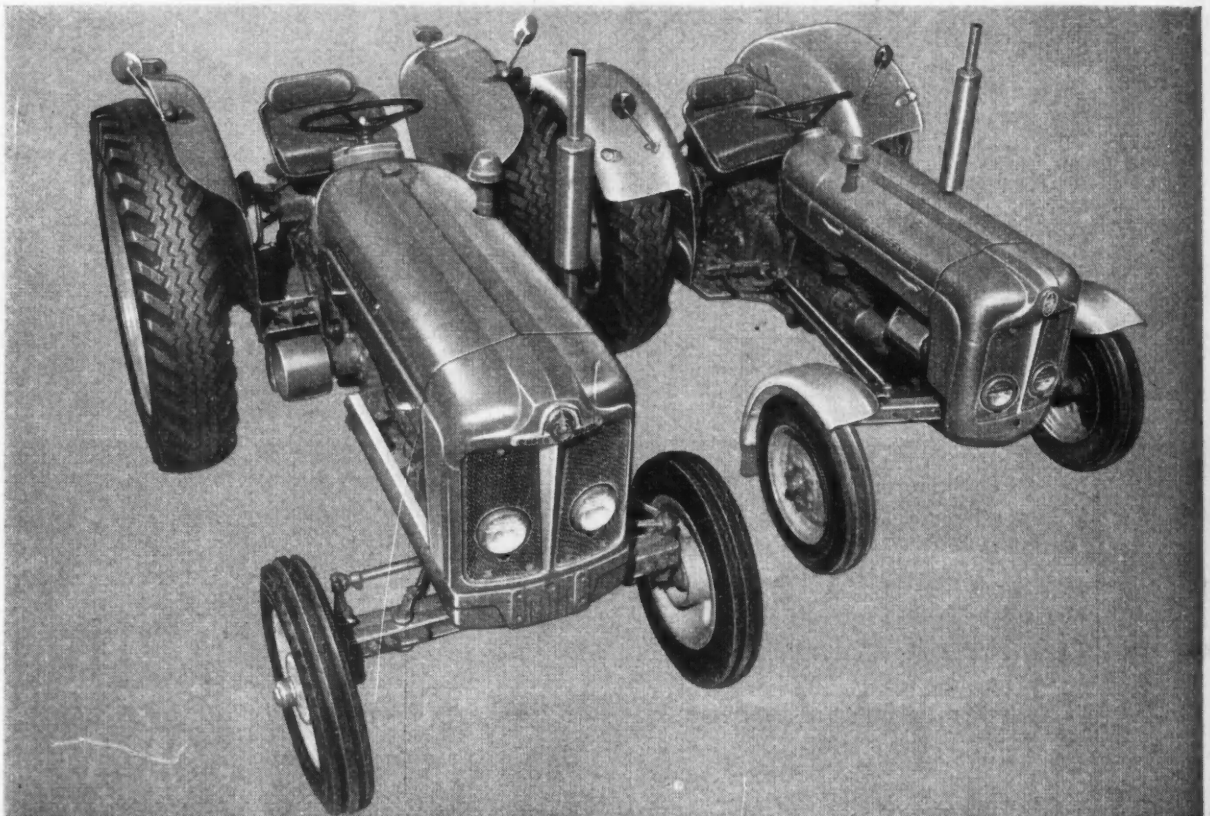
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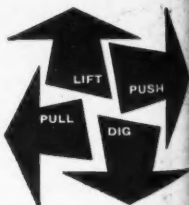


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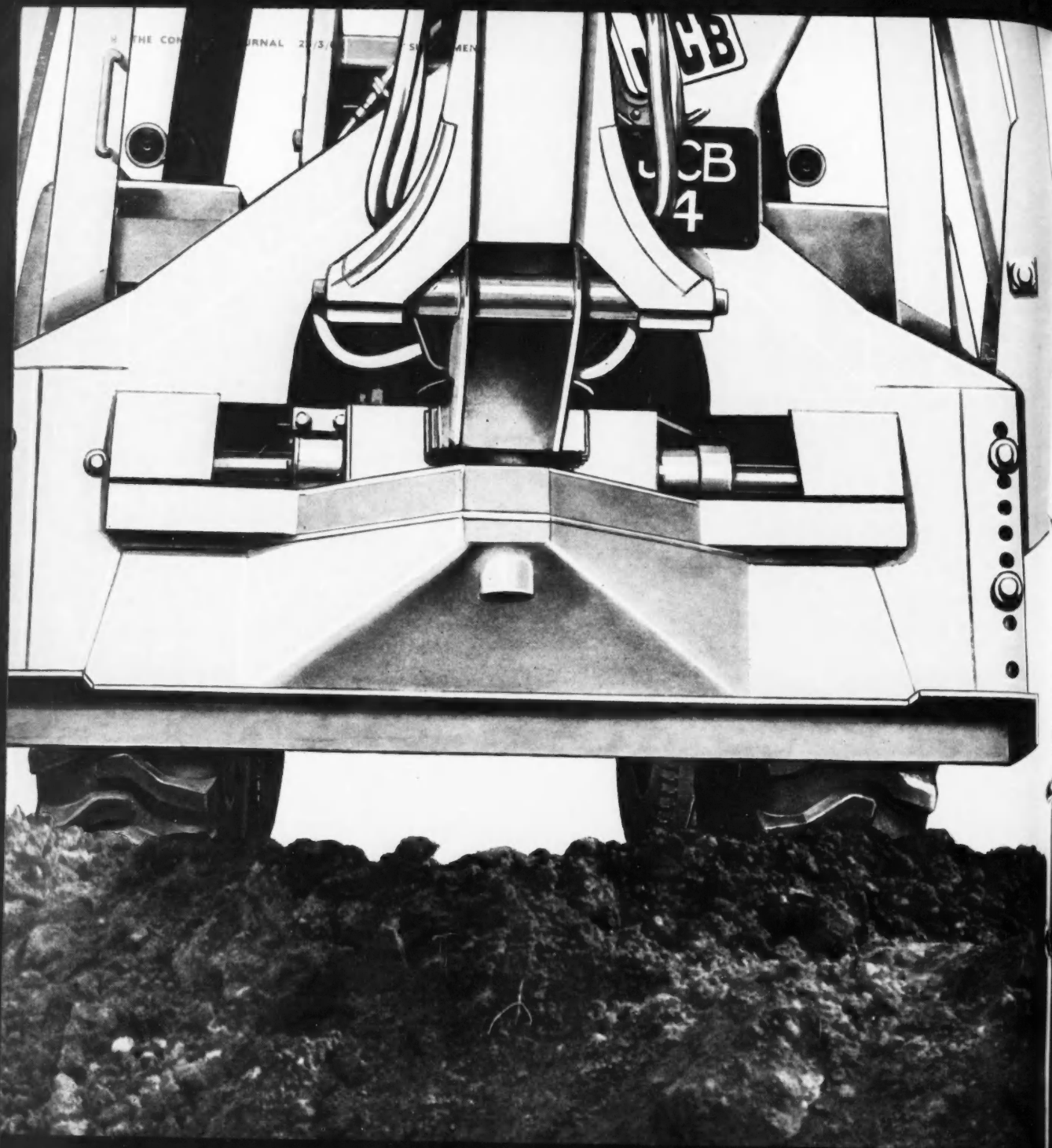
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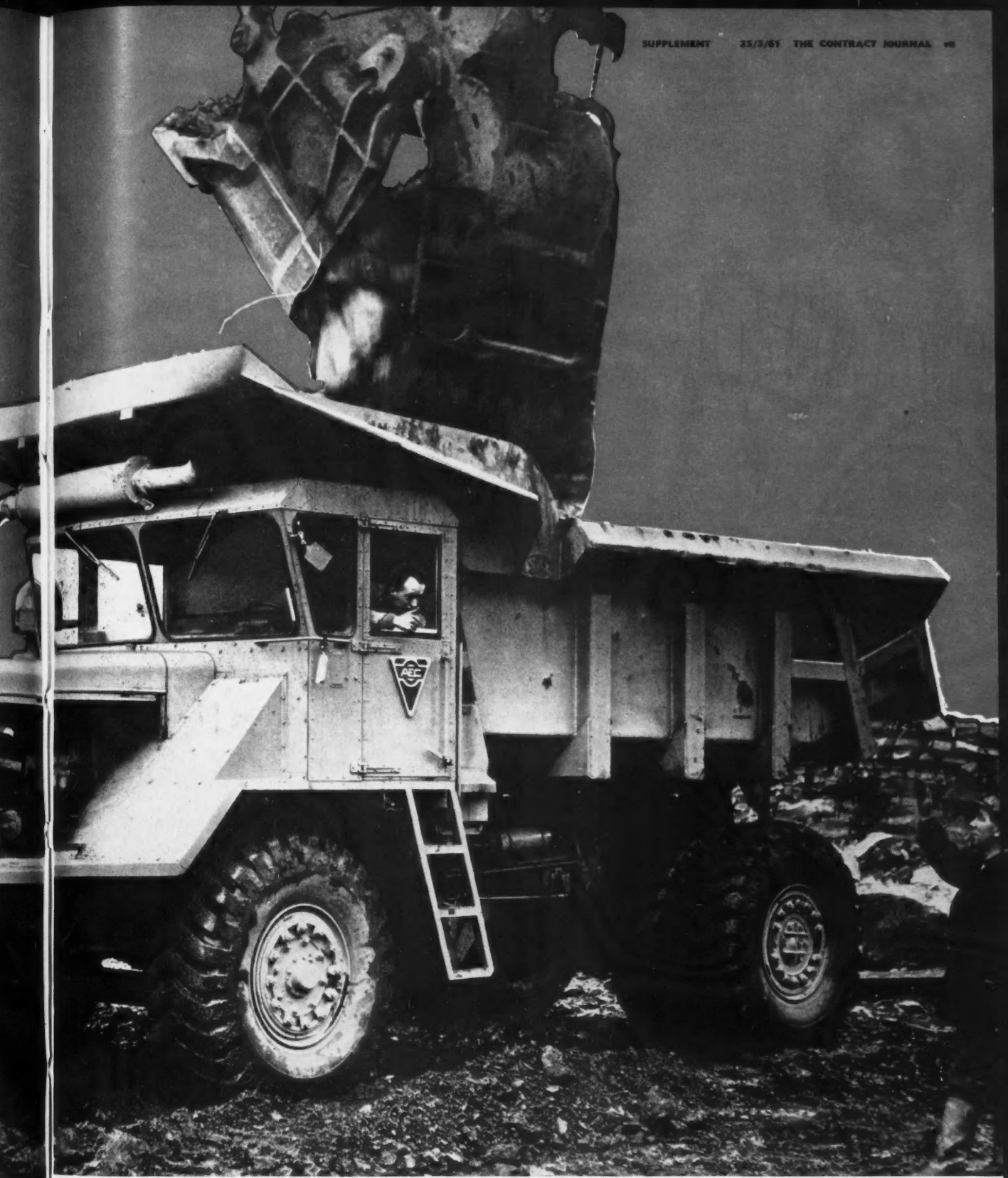
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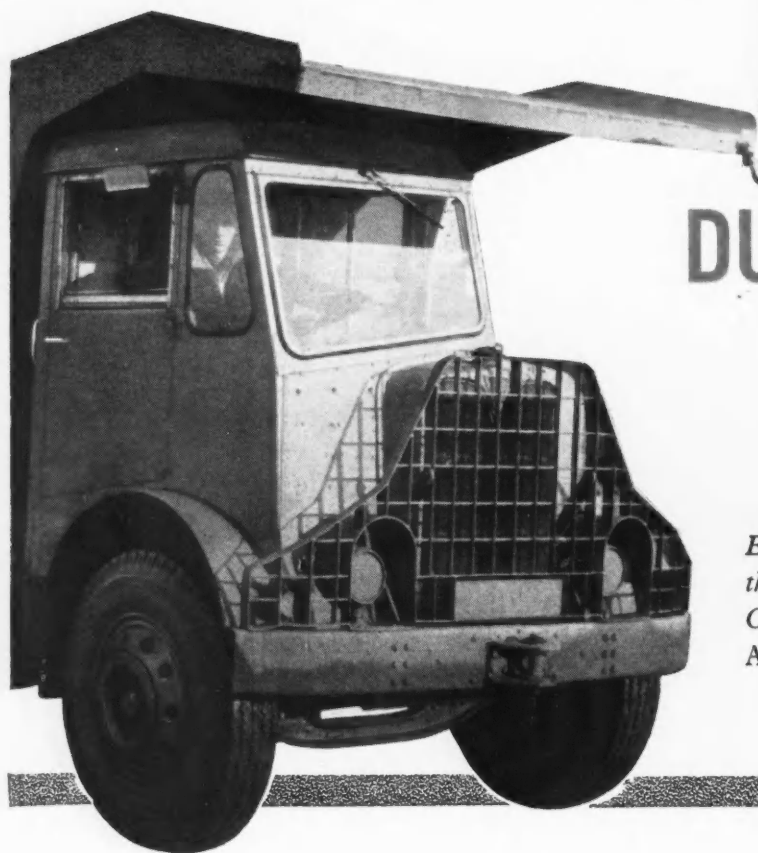
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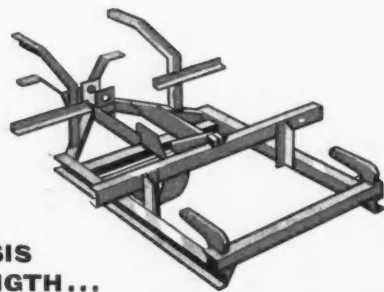
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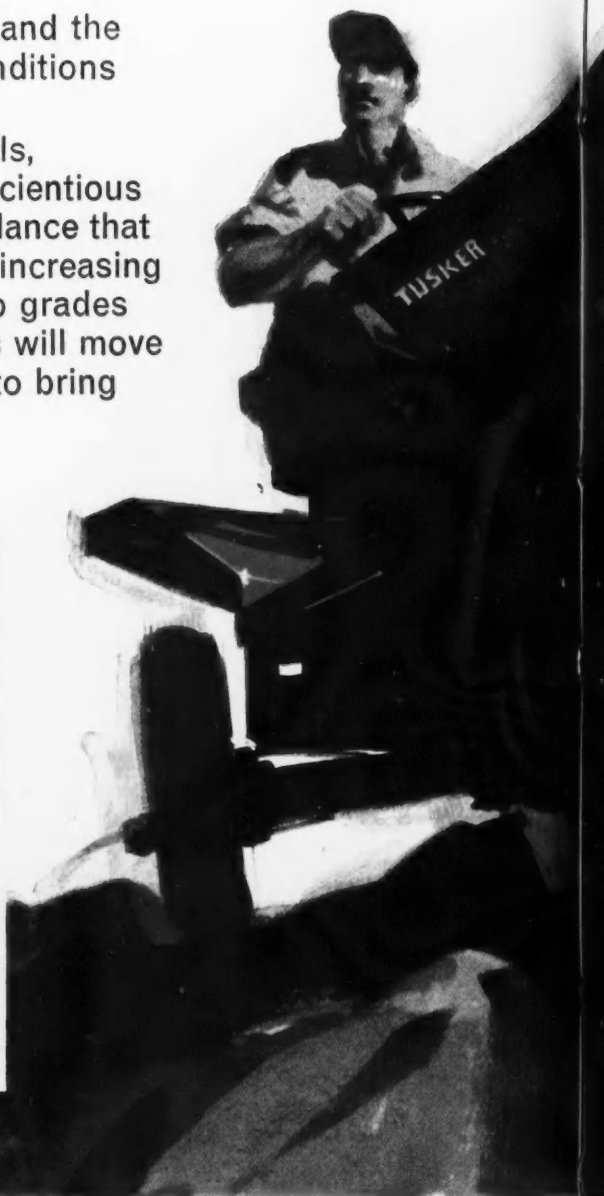
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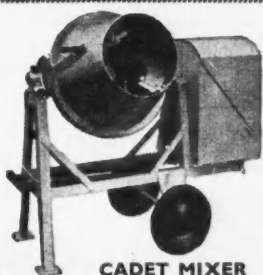
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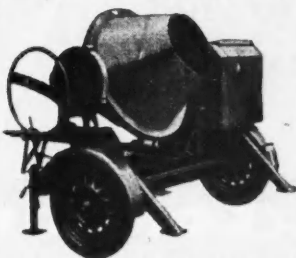
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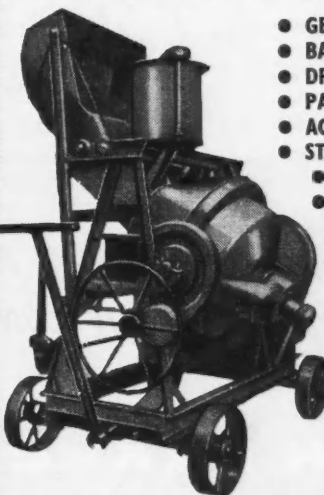
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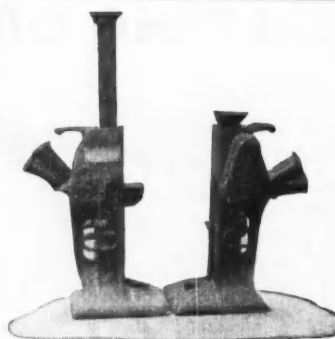


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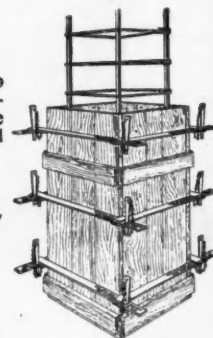
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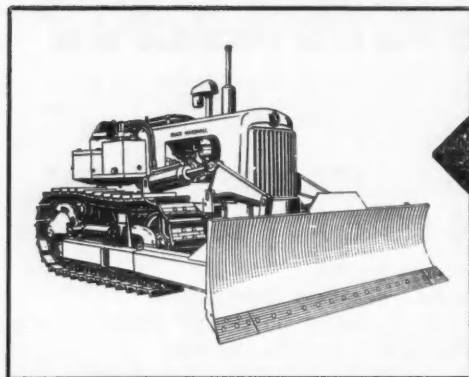
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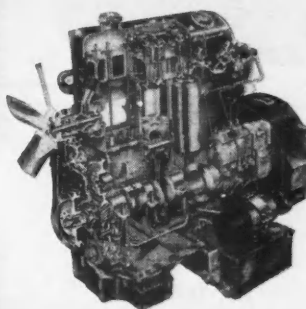


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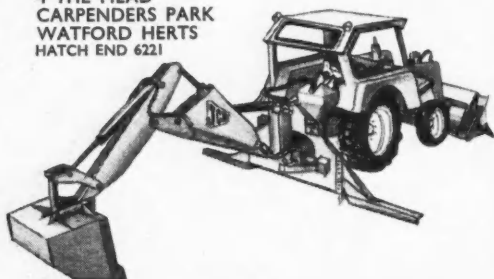
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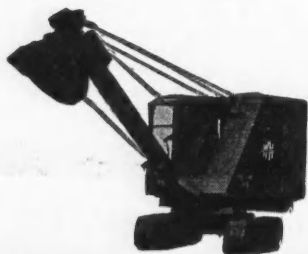
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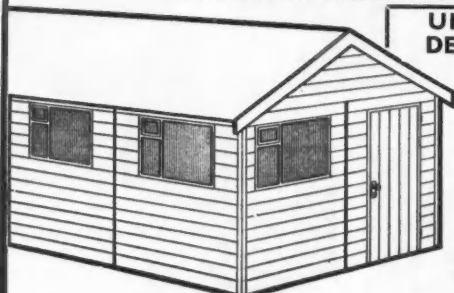
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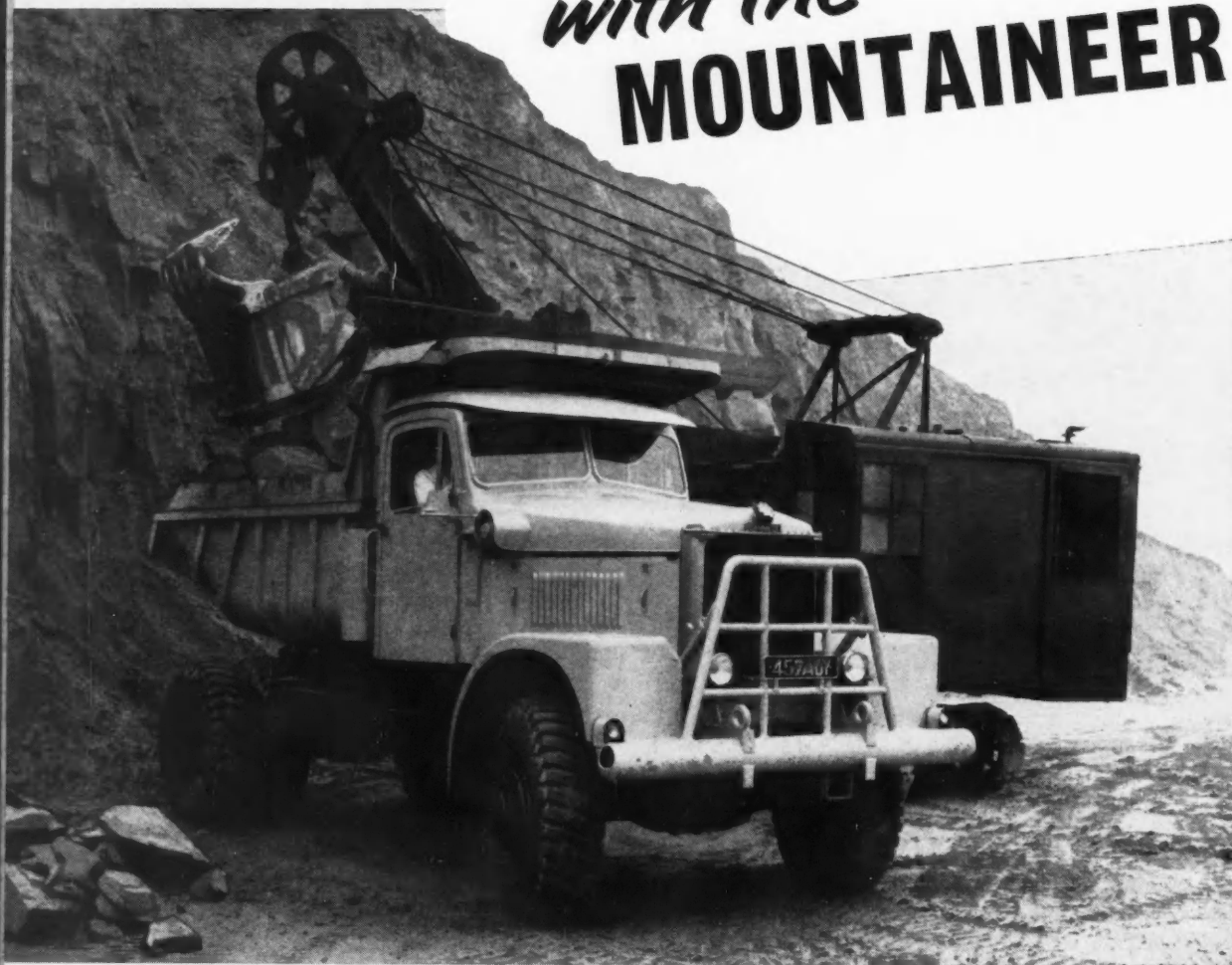
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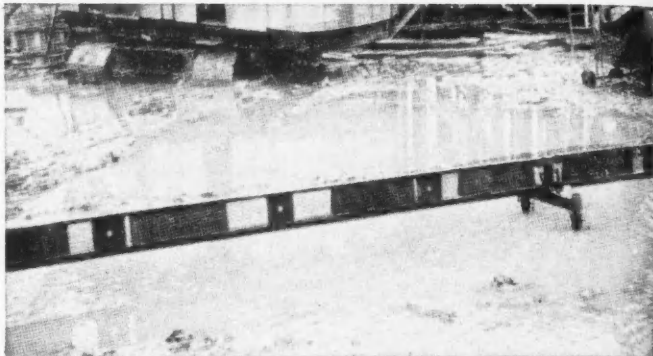


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OR, PERHAPS THIS***



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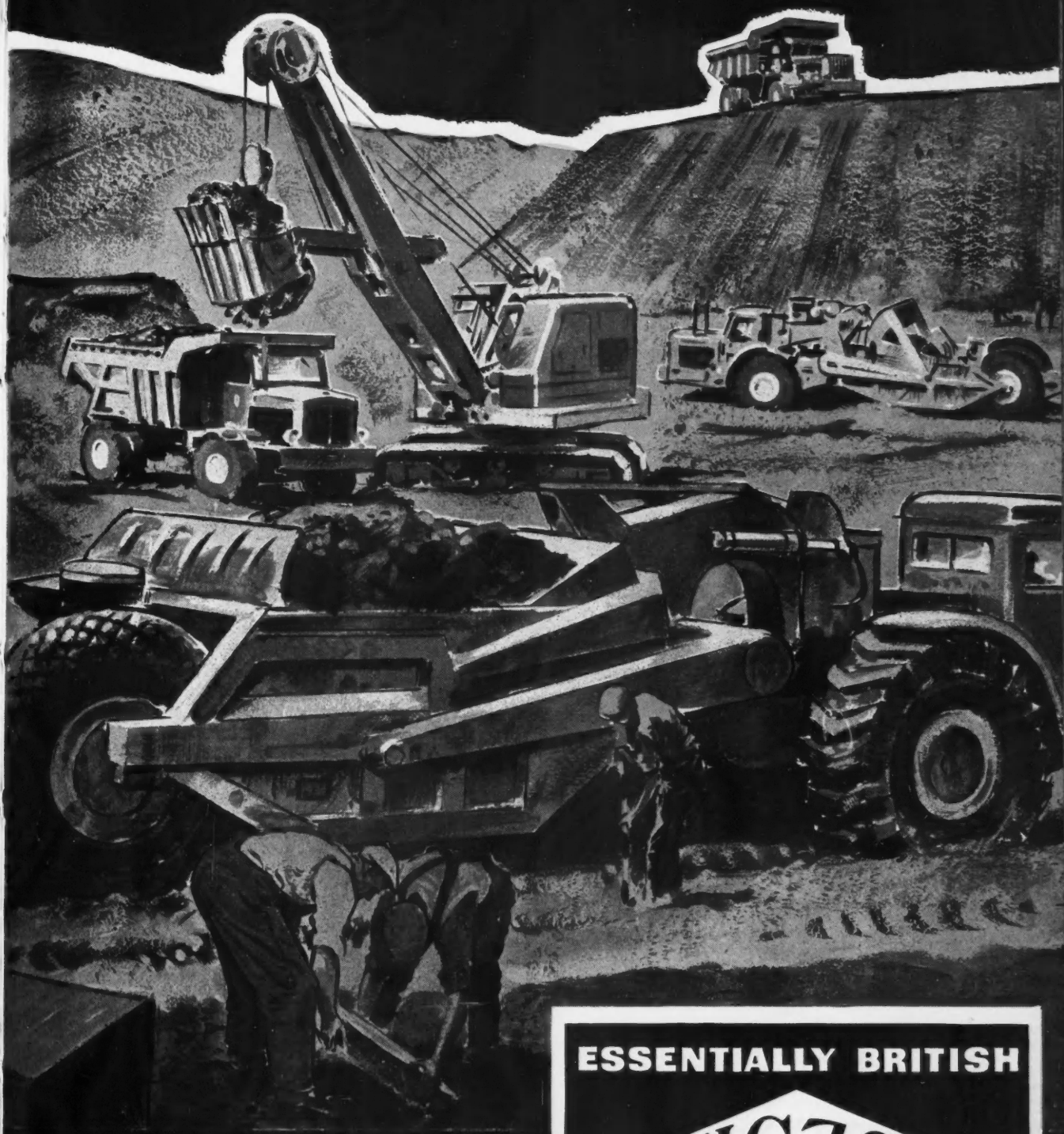
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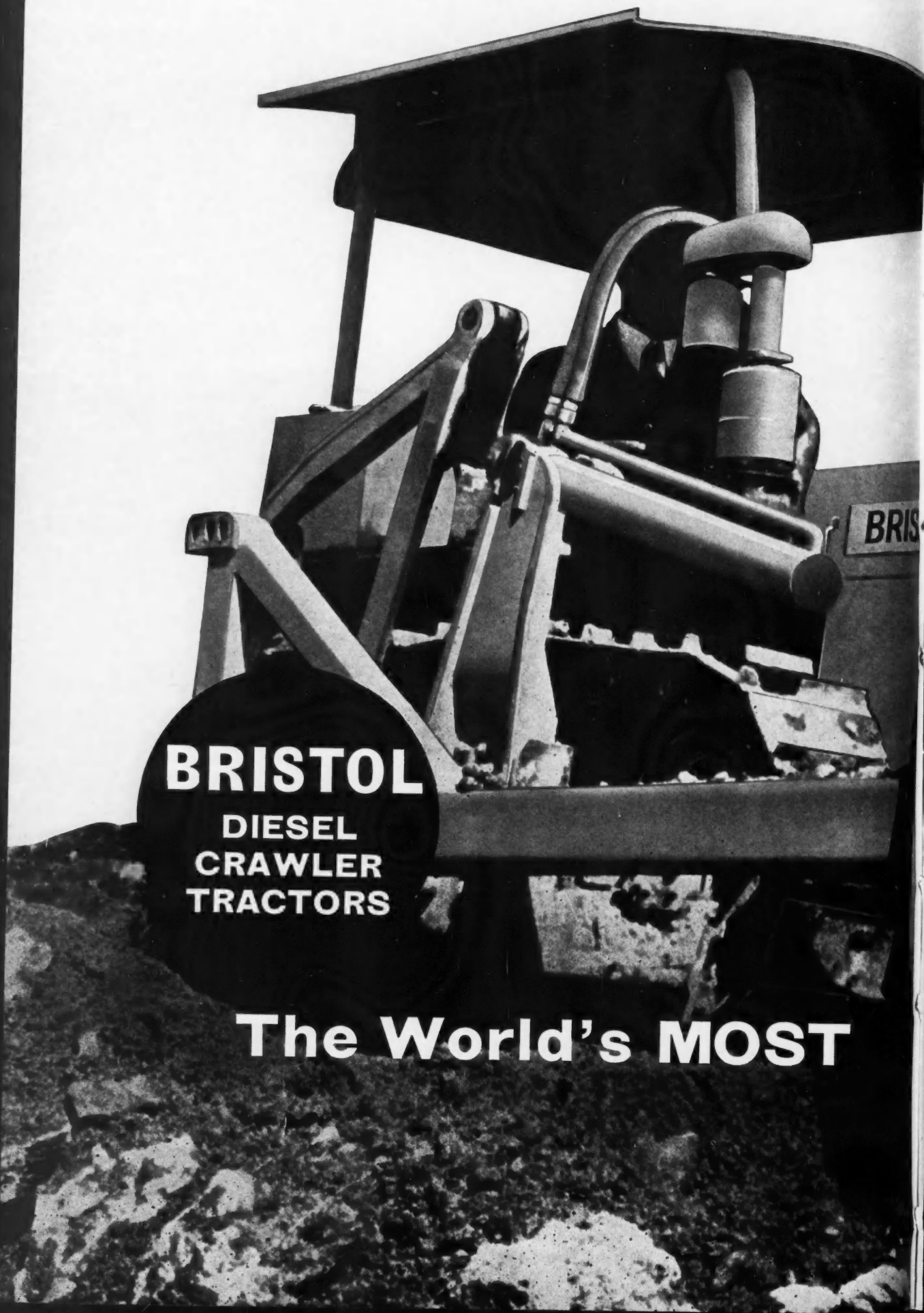
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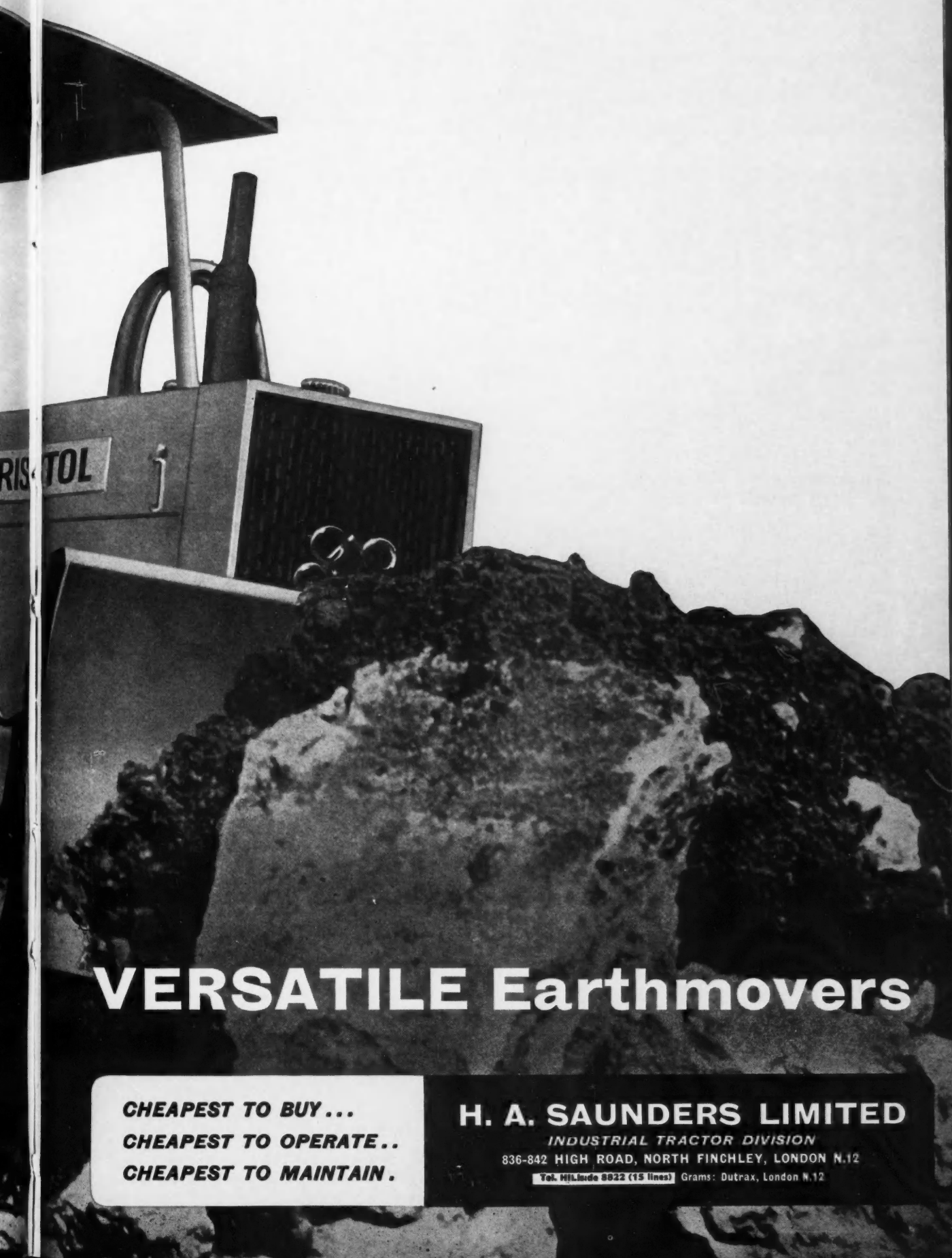


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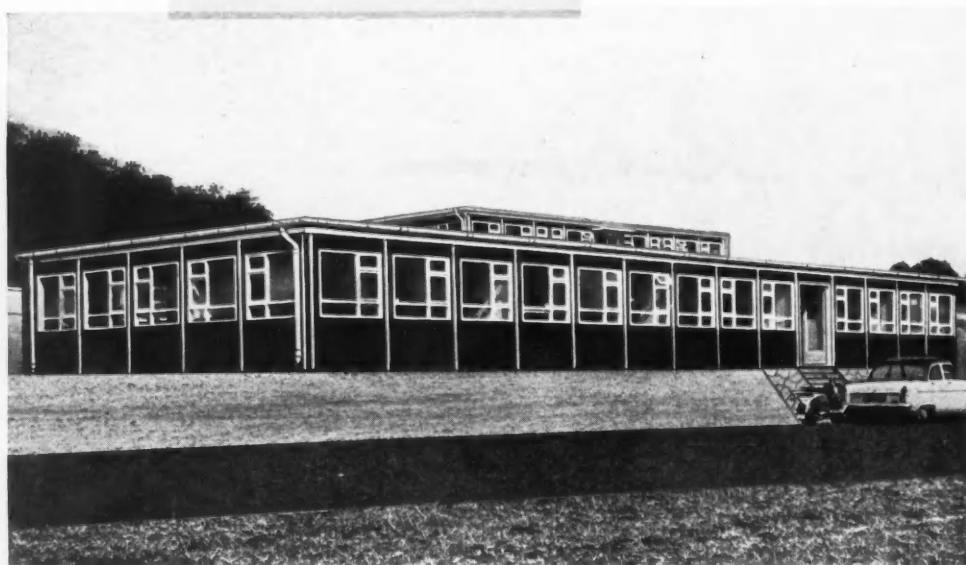
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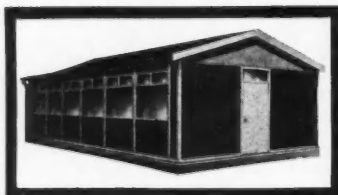
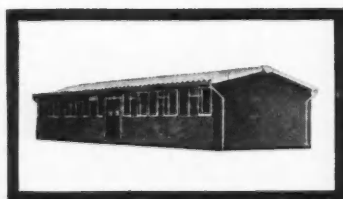
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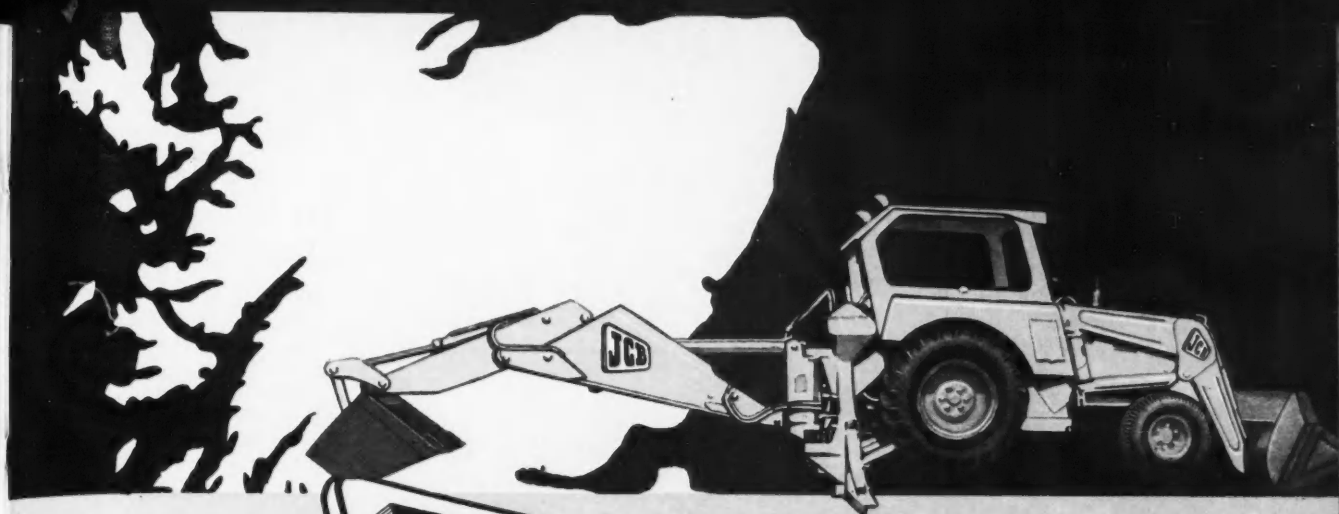


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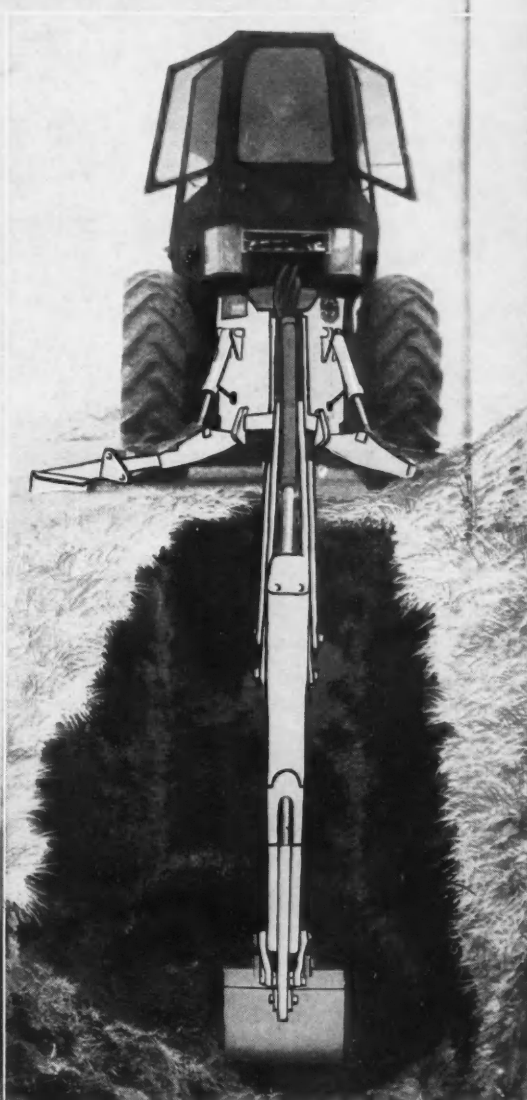
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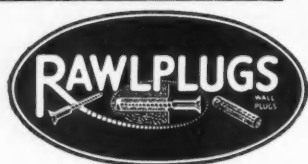
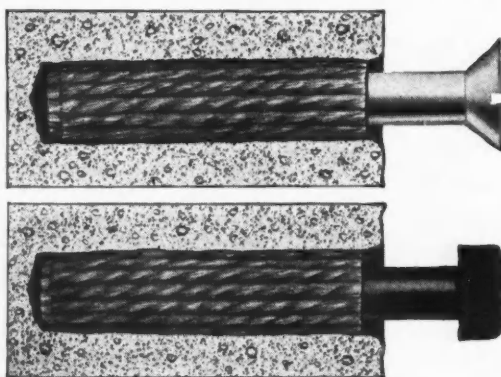




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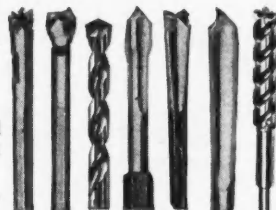
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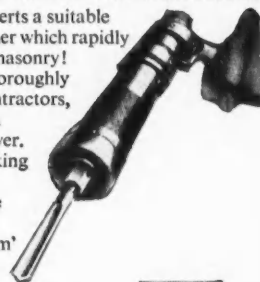


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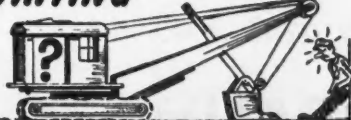
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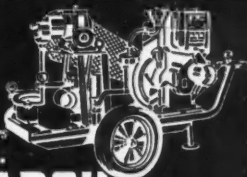
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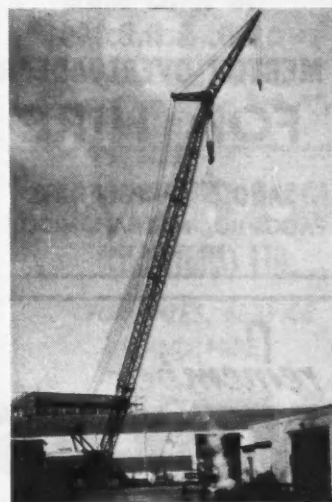
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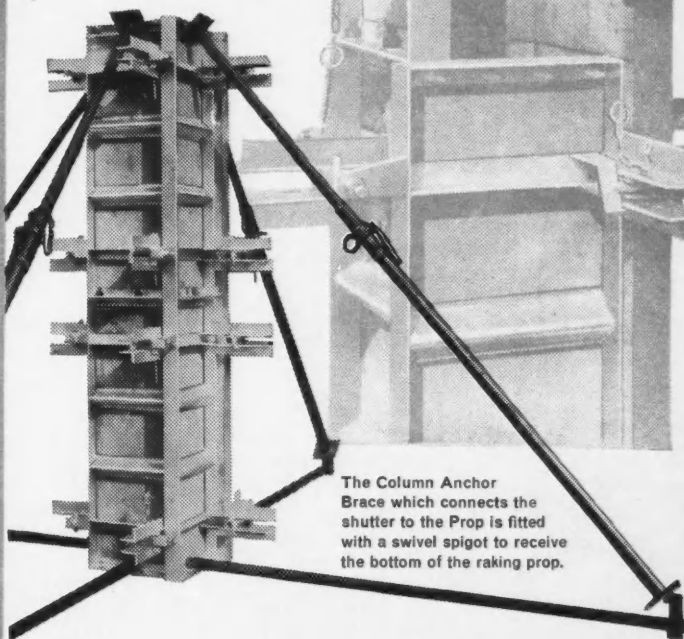
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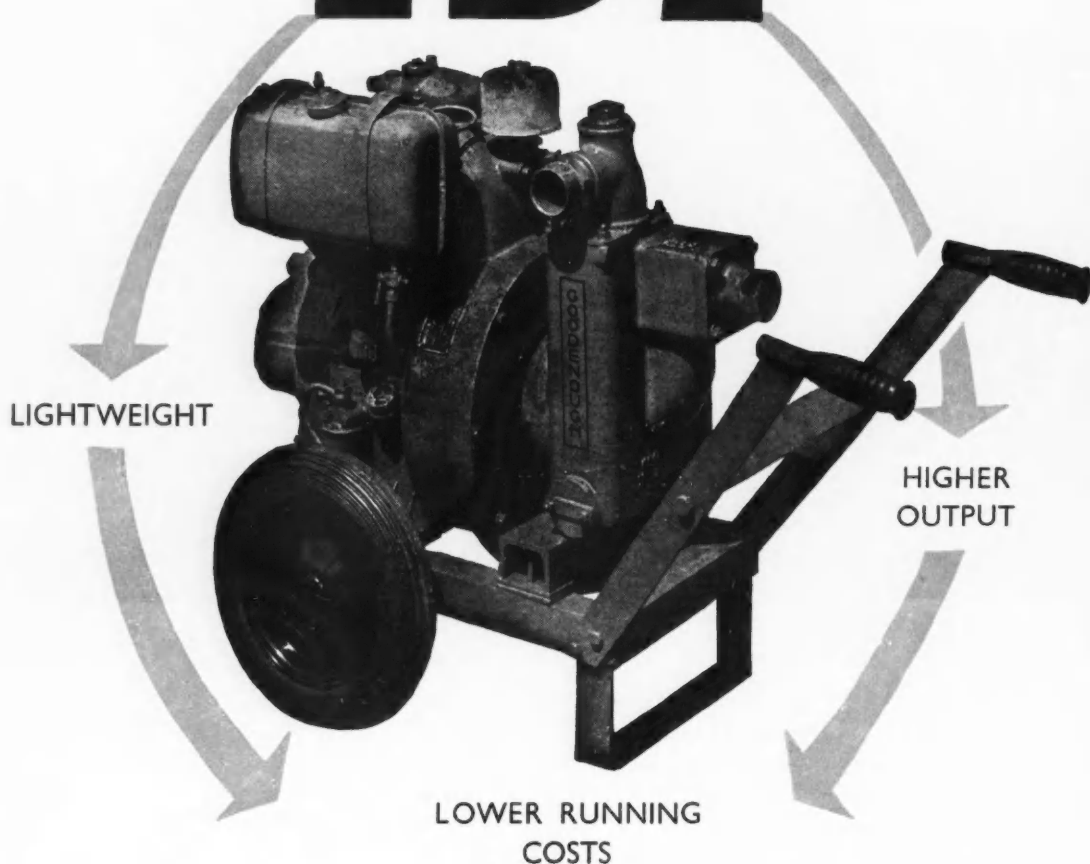
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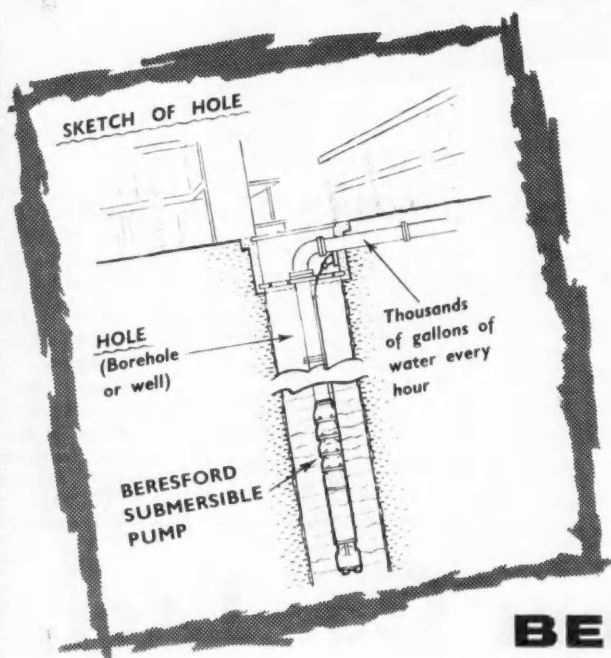


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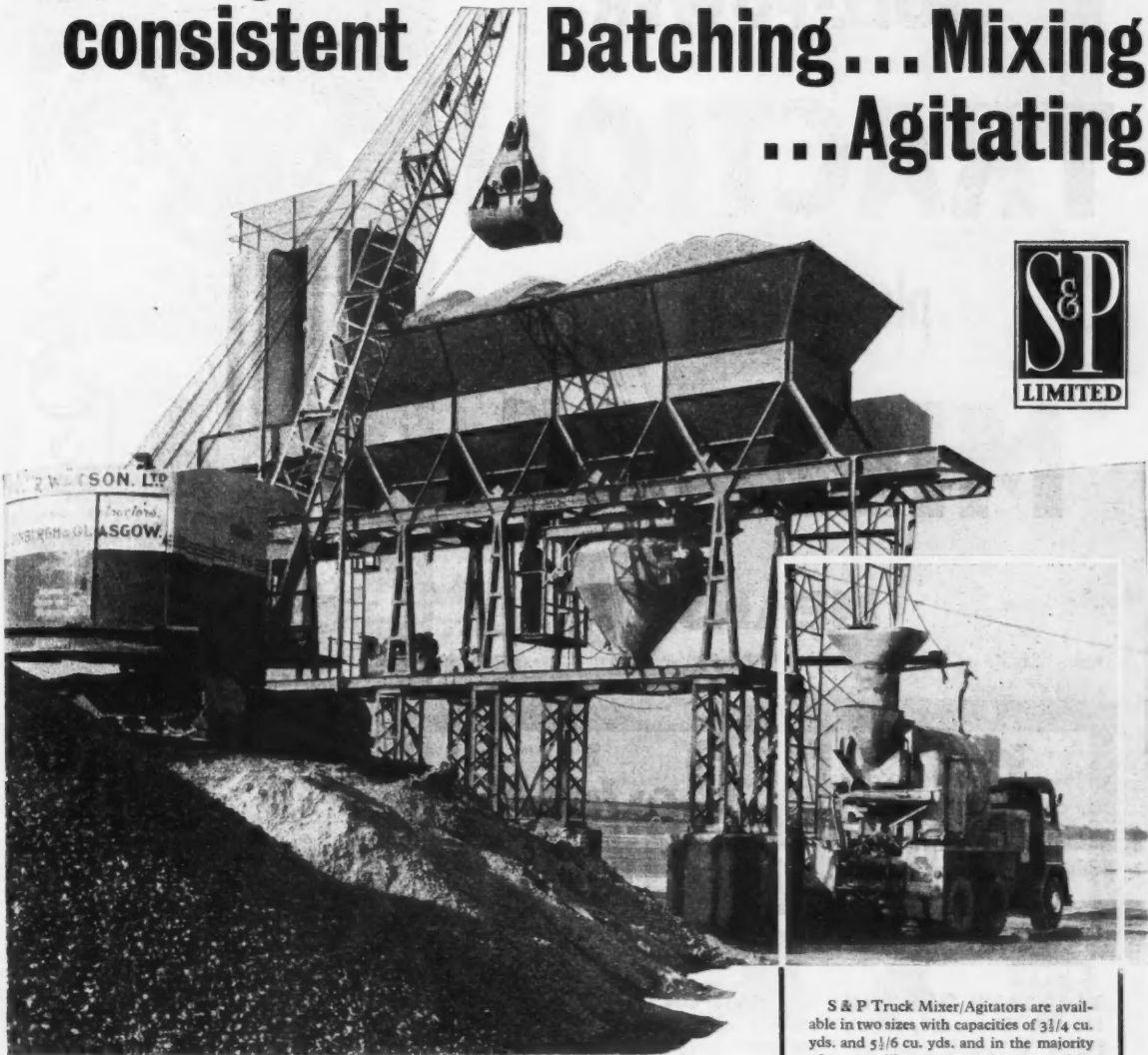
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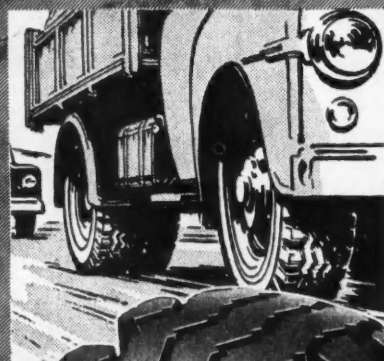
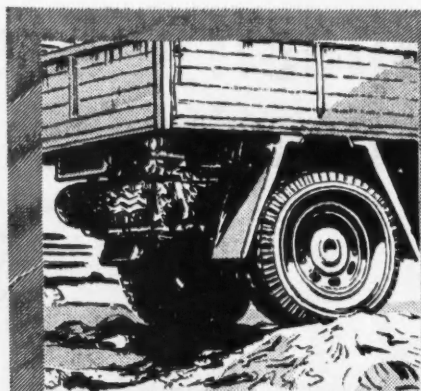
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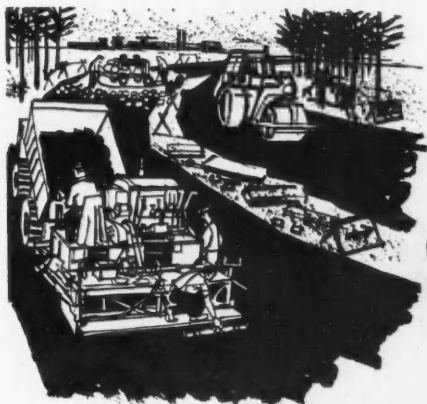
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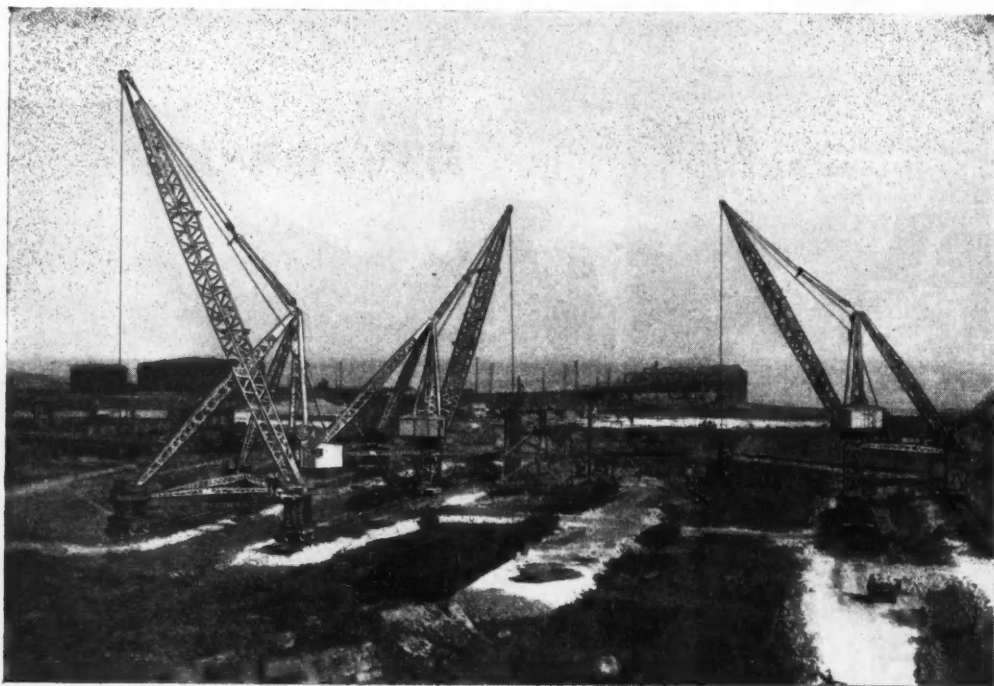
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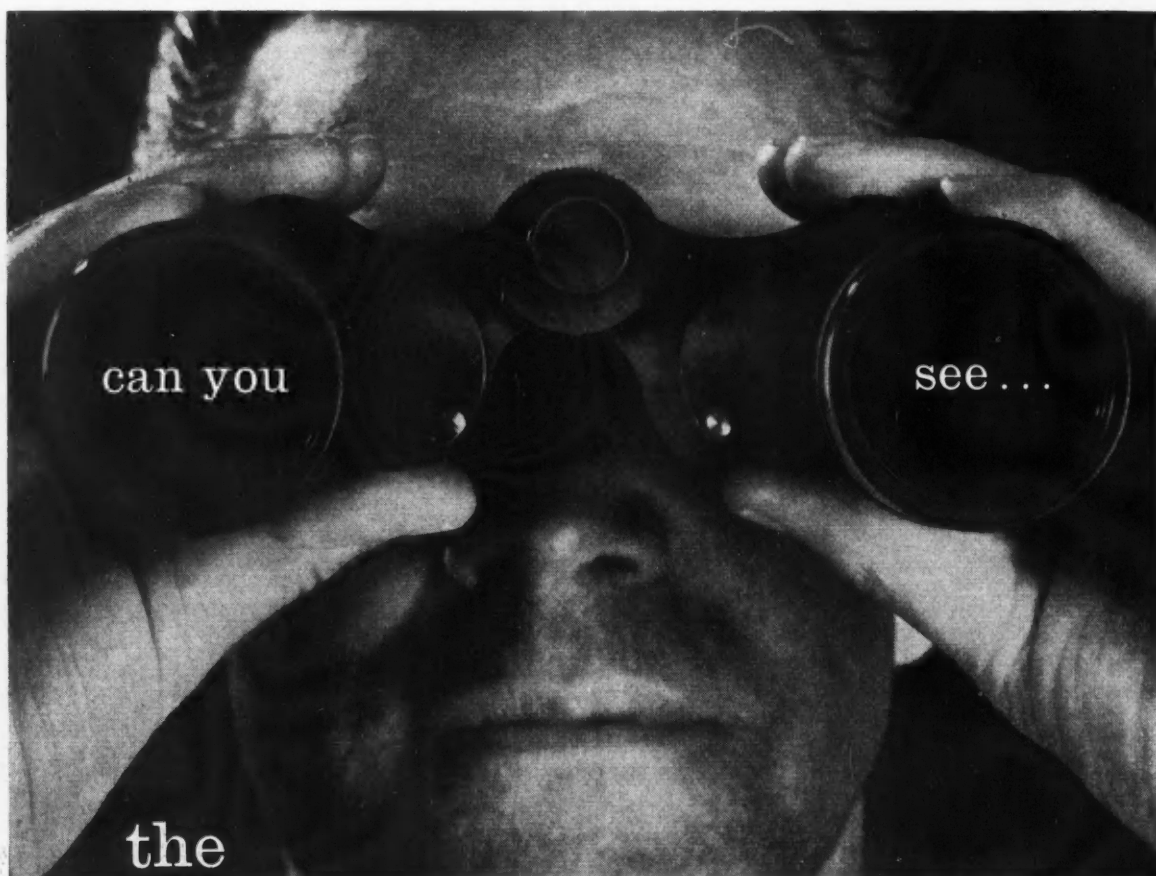


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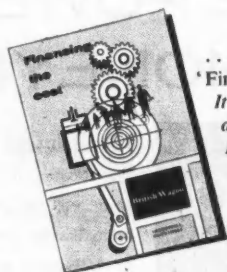
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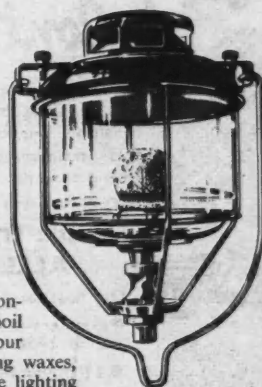
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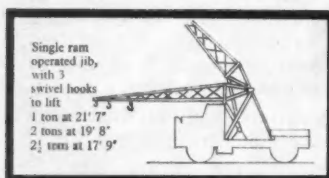


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Applications are invited on behalf of Holland & Hannen and Cubitts (Overseas) Ltd., from PROJECT MANAGERS, ENGINEERS, SURVEYORS, ACCOUNTANTS AND GENERAL FOREMEN interested in working in the Middle East, Africa, or the West Indies. Applications should be by letter in the first instance, giving full particulars of qualifications, past experience, age, marital status, salary and type of position held at present. Appointments offer continuity of employment within the Group. The strictest confidence will be maintained and envelopes should quote reference O.S.41.

Please address your application to:

Personnel Manager (S.A. Section),
HOLLAND & HANNEN AND CUBITTS LTD.,
1 QUEEN ANNE'S GATE, LONDON, S.W.1.
Tel: WHITEHALL 3111

If you are not yet sufficiently experienced for these vacancies but wish to have the opportunity to progress in the building industry, please write to our Personnel Department giving details of your career and stating your ambitions—we may be able to help you.

Offices at EDINBURGH · GLASGOW · NEWCASTLE
LIVERPOOL · BRISTOL · TORONTO · MONTREAL · VANCOUVER
WELLINGTON, N.Z. · PORT OF SPAIN, TRINIDAD · BEIRUT

Cubitts are always on the look-out for men with initiative and enterprise. We have an international reputation for pioneering new methods and construction techniques. We need men able to make the most of the challenging opportunities presented by major construction projects.



a job with Cubitts has much to offer . . .

. . . much to offer in the development of individual skills—and a worthwhile career.

. . . much to offer in applying the most up-to-date construction techniques—but also using well-proved methods.

. . . much to offer to the man who can bring to the job enthusiasm, keenness and above all *ability*.

Working conditions at Cubitts are designed to stimulate individual effort. The company operates bonus and pension schemes, and offers other incentives.

Mr. E. E. Batty, Personnel Manager, will be pleased to discuss present vacancies and future opportunities in an organisation which offers a rewarding future.

CUBITT PROJECTS NOW UNDER CONSTRUCTION



Cubitts are playing their part in the L.C.C.'s £5½ million Hyde Park Corner—Marble Arch Improvement Scheme, as a member of the Cubitts Fitzpatrick Shand consortium.



This 950 ft. long, 68 ft. wide and 55 ft. high building for a glass plant at Doncaster has a pre-cast concrete frame in 25 ft. bays; with roof beams span 64 ft. without intermediate supports.



Cubitts are building a 160 ft. high block of flats as the dominant feature of Basildon Town Centre. When completed this will be the tallest residential building in any of the New Towns.

CUBITTS

HOLLAND & HANNEN AND CUBITTS LTD.
1 QUEEN ANNE'S GATE, LONDON, S.W.1

MATHEW BROTHERS

are buying—

—SURPLUS

Contractors' Plant and
Civil Engineering Equipment

*offers
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BRAITHWAITE PILING AND STEELWORK



The Don River Bridge on the Doncaster By-Pass

AGENT AUTHORITY: The County Council of the West Riding of Yorkshire.
S. Maynard Lovell, O.B.E., E.R.D., T.D. *County Engineer and Surveyor.*
CONTRACTORS: CUBITTS, FITZPATRICK, SHAND.

The piling to the foundations executed by Braithwaite Foundations and Construction Limited consists of 94 reinforced concrete cylinders 54" in diameter carrying 370 tons each.

The deck steelwork consists of rivetted box girders and plate girders fabricated by Braithwaite & Co. Structural Limited weighing 2,200 tons; the seven spans total 760 ft. in length.



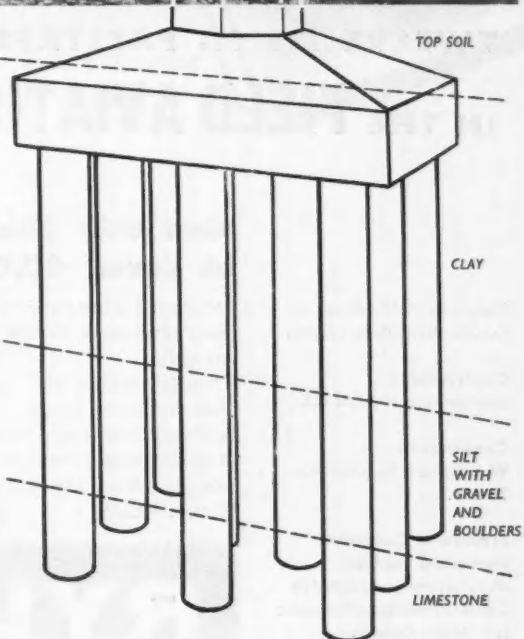
BRAITHWAITE & CO. ENGINEERS LIMITED

BRIDGE & CONSTRUCTIONAL ENGINEERS

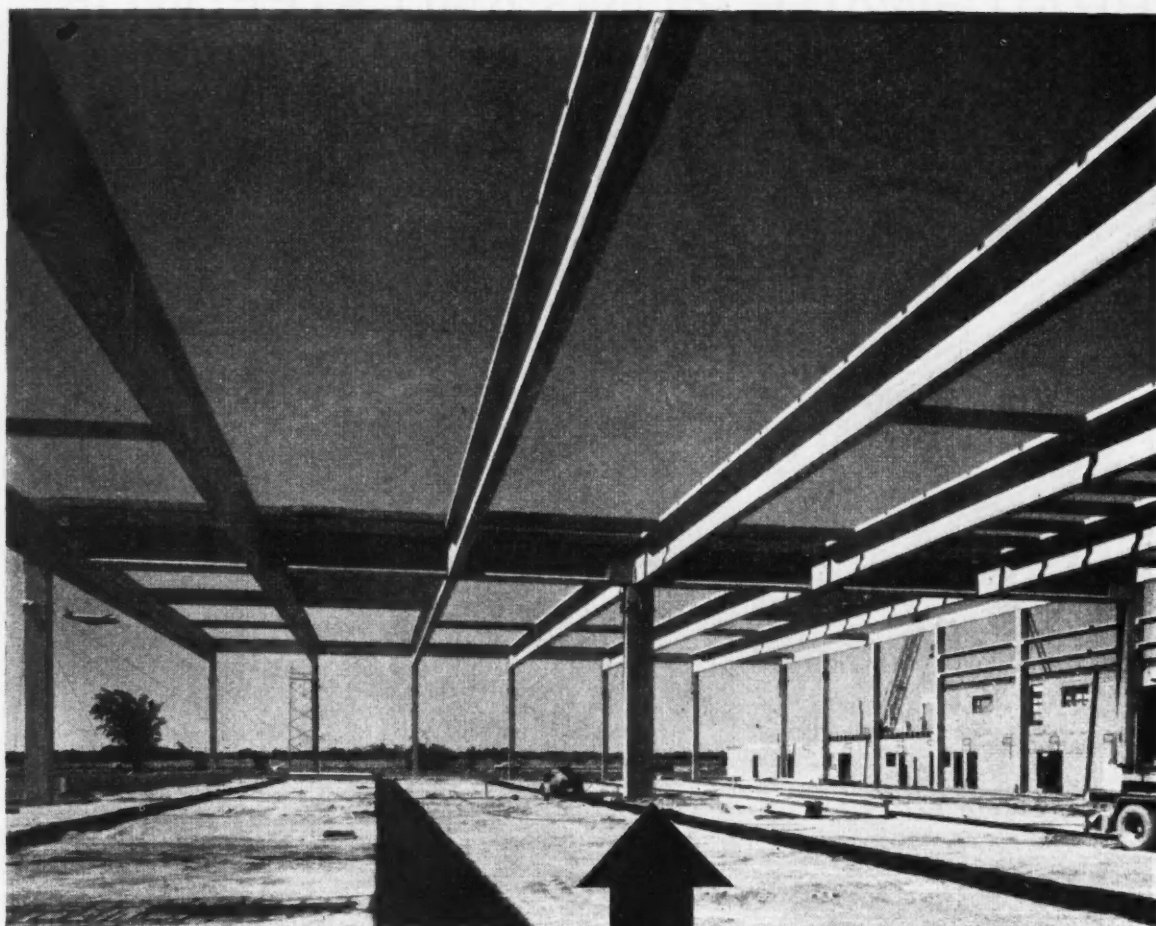
London Office: Dorland House, Regent St., London S.W.1

Telephone: WHitehall 3993

Telegrams: Bromkirk phone London Telex: 23320



BRAITHWAITE & CO. STRUCTURAL LIMITED • BRAITHWAITE FOUNDATIONS & CONSTRUCTION LIMITED



TWELVE 126 ft. PRESTRESSED CONCRETE BEAMS
IN THE FIELD AVIATION HANGAR

need only one **VERTICAL** support
 to cover 40,000 sq. ft. of floor area

*Hangar for Field Aviation at
 Toronto International Airport.*

Contractors:
Community Enterprises Ltd.

Consultants:
*W. S. Atkins & Associates Ltd.,
 Toronto.*

**Structural Concrete;
 frame and roofing:**
*Manufactured and erected by
 Standard Prestressed Structures
 Ltd., Maple, Ontario.*

Prestressed concrete provides the Architect with a medium which has many advantages; flexibility in design, speed of construction and structural strength.

These advantages are readily demonstrated in the construction of this Malton Hangar where a single column is the sole support within the building. Costs were reduced by the beam design which reduced the area of roofing material and the speed of erection of the framework which only took one week. When you think of prestressed concrete, think of RYLANDS Wire or Strand.

RYLANDS

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 IN THE
 WORLD OF WIRE

BROTHERS LTD • WARRINGTON • ENGLAND

ARE YOU A SERVICE MANAGER?

**WITH A WIDE KNOWLEDGE OF
HYDRAULIC EARTHMOVING**

EQUIPMENT

We are looking for a Top Grade Service Manager to take charge of our Service Company, and control a world-wide spares and service organization.

The man we want must have drive and be prepared to work hard. He will be responsible for advising on the expansion of his department and be able to implement Directorial policy on his own initiative.

If you have had experience in hydraulics and earthmoving equipment and have all the answers on service and spares of a product such as ours, please write giving fullest possible details of past experience and academic achievements.

The factory is set in an attractive country district and offers ideal working conditions.

A contributory pension scheme is in operation. Applications in writing, which will be treated in the strictest

confidence, to: **The Sales Director,**

J. C. Bamford (Excavators) Ltd.,

Lakeside, Rocester, Staffs.



CONTRACTS

BOROUGH OF CHATHAM.

ORDNANCE STREET REDEVELOPMENT AREA.
12 FLATS IN PERRY STREET.

TENDER documents for THIS PROJECT will be available shortly.

Contractors who wish to tender are invited to submit their names, together with a cheque for Two Guineas which will be refunded after receipt of a bona-fide Tender or return of Tender documents to J. A. T. RICHARDS, Borough Engineer and Surveyor, Town Hall, Chatham.

Tenders to be received not later than 12 Noon on FRIDAY, 7th April, 1961.

The Council does not bind itself to accept the lowest or any Tender.

ROWLAND NEWNES,
Town Clerk.

Town Hall,
Chatham.

BOROUGH OF ASHTON-UNDER-LYNE.

RECONSTRUCTION OF PLANTATION FARM
SEWAGE DISPOSAL WORKS.

TENDERS are invited from experienced contractors for the RECONSTRUCTION OF PLANTATION FARM SEWAGE DISPOSAL WORKS, comprising the Demolition of existing Structures, New Inlet Arrangements, Four 60ft. dia. Sedimentation Tanks, Dosing Chambers, Two 150ft. dia. Percolating Filters, Two 60ft. dia. Humus Tanks, 50ft. dia. Sludge Digestion Tank, Combined Sludge Heater and Pumphouse, New Sludge Drying Beds, and Alterations to the existing Rectangular Tanks to provide Storm Water and Secondary Sludge Digestion Tanks. Certain structures are to be supported on Concrete Piles driven by a nominated sub-contractor.

Drawings may be inspected, and the Contract documents obtained from the Consulting Engineers, MESSRS. CHARLES J. LOMAX AND SON, Chartered Civil Engineers, 68 Barton Arcade, Manchester, 3, on payment of a deposit cheque for 10 Guineas (cheques only, made payable to the Borough Council) which will be refunded on receipt of a bona-fide Tender not subsequently withdrawn.

Sealed Tenders, endorsed "Tender for Reconstruction of Plantation Farm Sewage Disposal Works," must be returned to the undersigned not later than Noon on FRIDAY, 14th April.

The lowest or any Tender will not necessarily be accepted.

G. A. MALONE,
Town Clerk.

Town Hall,
Ashton-under-Lyne,
Lancashire.

BOROUGH OF BOSTON.

WEST SIDE SEWERAGE SCHEME.

Applications are invited from contractors wishing to submit FIXED-PRICE TENDERS for the ABOVE WORKS, to be included on a selected list from whom Tenders will be invited.

The Scheme includes the Laying of approx. 3,250 lin. yd. of SEWER (60in. to 9in.), together with Manholes and other works. The Sewers are to be in the same lines as the existing Sewers, and the flow must be maintained at all times.

Contractors wishing to receive Forms of Tender, Quantities and Specifications should apply to the Borough Engineer and Surveyor, Municipal Buildings, Boston, Lincs., by 29th MARCH, 1961, and submit a list of similar schemes which they have carried out, stating the contract value and the name of the employing authority.

A deposit of 25 £s. will be required from the selected tenderers, which will be returned on receipt of a bona-fide Tender which is not subsequently withdrawn.

The Council do not bind themselves to invite Tenders from all applicants nor to accept the lowest or any Tender.

C. L. HOFFROCK GRIFFITHS,
Town Clerk.

Municipal Buildings,
Boston, Lincs.

CHISLEHURST AND SIDCUP
URBAN DISTRICT COUNCIL.FOUL SEWER EXTENSION—LEESONS HILL,
CHISLEHURST.

TENDERS are invited for CONSTRUCTION of 960 lin. yd. of 9in. FOUL SEWERS, and 1,200 lin. yd. of 6in. and 4in. FOUL DRAINS, together with Manholes, Inspection Chambers, and ancillary works.

Plans and Conditions of Contract may be inspected at the Office of the Engineer and Surveyor, Manor House, Sidcup, from whom documents can be obtained upon payment of Two Guineas deposit, returnable upon receipt of a bona-fide Tender.

Tenders to the undersigned by 29th MARCH, 1961.

T. W. FAGG,
Clerk of the Council.

Sidcup Place,
Sidcup, Kent.

WHISTON RURAL DISTRICT COUNCIL.

SEWERAGE AND SEWAGE DISPOSAL WORKS—
HALEWOOD.

TENDERS are invited for the ABOVE CONTRACT, which comprises the following works:

- 1,100 yd. of 24in. dia. Cast-Iron Pipe laid in trench.
- 850 yd. 18in. dia. Concrete Pipe laid in trench.
- 3,000 yd. 39in. dia. Concrete Pipe laid in trench.
- 1,800 yd. 12in. and 15in. dia. Cast-Iron Pipes laid side by side in trench.
- Sewage Treatment Works, comprising Gauging Flumes, Screen Chambers, a Detritus Channel, Three Sedimentation Tanks 60ft. in dia., 20 Sludge Drying Beds each 100ft. x 40ft., and an Auxiliary Pumping Station.

The Drawings, Conditions of Contract, Specification, Bills of Quantities and Form of Tender may be obtained from Mr. A. J. BEBBINGTON, Engineer and Surveyor, Council Offices, Delph Lane, Whiston, Preston, Lancs., or from Messrs. HUSBAND AND CO., Consulting Engineers, 388 Glossop Road, Sheffield, 10, on payment of a deposit of Three Guineas, which will be returned on receipt of a bona-fide Tender, not subsequently withdrawn.

Tenders are to be delivered, in the envelope provided, and are to reach the undersigned not later than Noon on MONDAY, 13th April, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

J. R. HENLEY,
Clerk of the Council.

Council Offices,
Whiston,
Preston.

CONTRACTS

COUNTY BOROUGH OF ROTHERHAM.

CONTRACT FOR THE SUPPLY OF DUSTBINS
FOR THE YEAR 1961/62.

TENDERS are invited for the SUPPLY of 2,000 GALVANISED DUSTBINS, 3¼ cu. ft. capacity, weighing complete with lid 28lb., and complying with B.S.S. 792 of 1947.

Form of Tender and Conditions of Contract may be obtained from the Borough Engineer, Municipal Offices, Rotherham, on application, and are to be returned to me, in a sealed envelope endorsed "Tender for Dustbins," but bearing no other mark indicating the sender, not later than MONDAY, 17th April, 1961.

The Council does not bind itself to accept the lowest or any Tender.

JOHN S. WALL,
Town Clerk.

Municipal Offices,
Howard Street,
Rotherham.

COUNTY BOROUGH OF
BARROW-IN-FURNESS.

HEALTH COMMITTEE.

RECONSTRUCTION OF SANDGATE PUMPING
STATION—CONTRACT NO. 1—
PUMPING PLANT.

TENDERS are invited for the SUPPLY and ERECTION OF PUMPING PLANT for Sandgate Pumping Station, comprising Two Main Pumps each of 8,000 gallons per minute capacity, One Sump Pump of 800 gallons per minute capacity, together with Motors and other Electrical Gear, Valves, Pipework, etc.

Forms of Tender, Specification and Drawings may be obtained from the Office of the Borough Engineer and Surveyor, J. N. FLITCROFT, A.M.I.C.E., Town Hall, Barrow-in-Furness.

Applications for Tender Forms, etc., must be accompanied by a deposit of £2 2s. which is returnable on receipt of a bona-fide Tender, or on return of all documents within seven days of receipt by the contractor.

Sealed Tenders, endorsed "Sandgate Pumping Station—Contract No. 1—Pumping Plant," are to be delivered to the Office of the undersigned not later than 12 Noon on MONDAY, 10th April, 1961.

The Corporation does not undertake to accept the lowest or any Tender.

LAWRENCE ALLEN,
Town Clerk.

Town Hall,
Barrow-in-Furness.

BOROUGH OF GOSPORT.

PRIVATE STREET WORKS.

CONTRACT NO. 2.

TENDERS are invited for the MAKING-UP OF SEVEN PRIVATE STREETS and appurtenant works, involving the following approx. quantities: 1,700 lin. yd. of 4in. dia. Surface Water Sewers; 20 Manholes and 90 Gullies; 14,700 sq. yd. of Asphalt and Bitumen Macadam Carriageway; 7,500 sq. yd. of Asphalt Footway; 3,500 sq. yd. of Turfing.

Tender documents are obtainable from the Borough Engineer, The Hall, Trinity Green, Gosport, upon deposit of Two Guineas, returnable on receipt of a bona-fide Tender not subsequently withdrawn, and the return of all documents.

Tender Forms should be submitted to me, in a plain sealed envelope endorsed "Tender for Private Street Works—Contract No. 2," and should bear no mark indicating the sender. Priced Bills of Quantities should at the same time be submitted to me, in a separate envelope similarly endorsed but bearing the name of the tenderer. Both envelopes must reach my Office no later than the First Post on WEDNESDAY, 19th April, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

EDWARD ADDENBROOKE,
Town Clerk.

Town Hall,
Gosport.

ERITH BOROUGH COUNCIL.

SPORTS PAVILION—NORTHUMBERLAND HEATH
PLAYING FIELDS, ERITH.

TENDERS are invited for the ERECTION of a SPORTS PAVILION incorporating Public Conveniences, Tea Room, etc.

Firms wishing to tender should make application to the Borough Engineer at Town Hall, Erith, Kent, by 27th MARCH, with a deposit of Two Guineas which will be refunded on receipt of a bona-fide Tender not subsequently withdrawn.

The Forms of Tender and Bills of Quantities will be forwarded on or about 10th April, 1961.

Tenders must be received by the undersigned, in the envelope, and bearing the green label which are provided, by 12 Noon on 5th MAY, 1961.

The Council are not bound to accept any Tender.

J. A. CROMPTON,
Town Clerk.

Town Hall,
Erith, Kent.

WAYLAND RURAL DISTRICT COUNCIL.

CONTRACT NO. 4.

EXTENSION OF EXCHANGE STREET SEWER,
ATTLEBOROUGH.

TENDERS are invited, on a Fixed-price Basis in accordance with the Ministry of Housing and Local Government Circular No. 31/57, for CONSTRUCTION of the ABOVE SEWER.

The work comprises the Laying of approx. 150 lin. yd. of 6in. dia. S.G.W. Sewer, four Precast Concrete Manholes, and House Connections.

General Conditions of Contract, Specification, Bill of Quantities and Drawings may be obtained from the Council's Consulting Engineers, MESSRS. J. D. AND D. M. WATSON, M.M.I.C.E., 67 Tutton Street, Westminster, London, S.W.1, on or after 6th March, 1961, on payment of a deposit of 10 Guineas, refundable only to contractors who submit bona-fide Tenders and return all documents and Drawings.

Deposit cheques should be made payable to Wayland Rural District Council.

Tenders must be returned in envelopes which do not bear any name or mark indicating the sender, endorsed "Tender for Contract No. 4," and delivered at the Office of the undersigned not later than Noon on MONDAY, 10th April, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

L. G. FRANCIS,
Clerk of the Council.

Wayland R.D.C.,
Council Offices,
Attleborough,
11th March, 1961.

CONTRACTS

METROPOLITAN BOROUGH OF
WANDSWORTH.

MULTI-STORY HOUSING.

Contractors, experienced in reinforced concrete work, who wish to TENDER for CONSTRUCTION of 308 DWELLINGS in 2-, 4-, 5-, 6- and 14-storey Blocks, together with Roads and Sewers, at BEAUMONT ROAD, Southfields, S.W.18, should submit names to me by 5th APRIL, 1961, giving details of experience, plant, and technical and supervisory staff available, together with names of two technical and two financial referees.

Bills of Quantities will be issued to selected contractors in due course.

Drawings may be examined at Office of MESSRS. CLIFFORD CULPIN AND PARTNERS, 39 Doughty Street, W.C.1.

J. NOEL MARTIN,
Town Clerk.

Municipal Buildings,
Wandsworth, S.W.18.

BOROUGH OF DORCHESTER.

WATERWORKS.

TENDERS are invited from experienced specialist contractors for the CONSTRUCTION of a BOREHOLE, 24-21in. diameter, approximately 300ft. deep, lined with steel tubing, and for the subsequent 14 days' continuous test pumping.

Documents from the Borough Surveyor, Municipal Office, North Square, Dorchester, on the deposit of £2 2s. returnable on the receipt of a bona-fide Tender not subsequently withdrawn.

Tenders to the undersigned in plain envelopes endorsed "Borehole," by Noon on SATURDAY, 8th APRIL, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

F. P. LAKE SYDENHAM,
Town Clerk.

Municipal Offices,
North Square,
Dorchester.

BOROUGH OF KENDAL.

SANDYLANDS HOUSING ESTATE—EXTENSION.

ROADS AND SEWERS—CONTRACT NO. 2.

The Corporation of Kendal invite TENDERS for the CONSTRUCTION of the FOLLOWING STREET and DRAINAGE WORKS on the ABOVE ESTATE—

- 8,910 super. yd. of Carriageway, consisting of Lean-mix Concrete Base, 2½in. Tarmacadam Base Course, Wearing Course, etc.
- 4,800 super. yd. of Tarmacadam Footpaths.
- 1,849 lin. yd. of Concrete and Salt Glazed Ware Sewers, of 15in. to 6in. diameter, together with Kerbing and Channelling Fencing and other relevant works.

Drawings may be inspected, and Bills of Quantities, Specifications, Conditions of Contract and Form of Tender may be obtained on application at the office of J. J. L'ÉVÈRE, A.M.I.C.E., Borough Engineer and Surveyor, Lowther Street, Kendal, on payment of a deposit of Two Guineas, which will be refunded on receipt of a bona-fide Tender.

Tenders, enclosed in a sealed envelope endorsed "Roads and Sewers—Sandylands," and not bearing any name or mark indicating the sender, must be delivered to the undersigned not later than 10 a.m. on THURSDAY, 20th April, 1961.

The Corporation do not bind themselves to accept the lowest or any Tender.

(Signed) F. J. PEARSON,
Town Clerk.

Town Hall,
Kendal.

14th March 1961.

BOWDON URBAN DISTRICT COUNCIL.

STREET LIGHTING.

TENDERS are invited for the SUPPLY and ERECTION of 105 GROUP B CONCRETE COLUMNS with POST TOP LANTERNS and including all ancillary equipment.

The Form of Tender, Bill of Quantities and Specification may be obtained from the Council's Surveyor at the address below.

Tenders, in plain sealed envelopes and marked "Group B Street Lighting," must reach the undersigned not later than Noon on SATURDAY, 1st April, 1961.

The Council do not bind themselves to accept the lowest or any Tender they may receive.

W. JACKSON,
Clerk to the Council.

Council Offices,
Richmond Road,
Bowdon,
Cheshire.

CHADDERTON URBAN DISTRICT
COUNCIL.

TENDERS FOR SURFACE DRESSING.

TENDERS are invited for LABOUR and MATERIALS for SURFACE DRESSING VARIOUS ROADS in the DISTRICT in the year ending 31st March, 1962.

Particulars and Forms of Tender may be obtained upon application to the Engineer and Surveyor, Town Hall, Chadderton.

Tenders, in sealed envelopes endorsed "Surface Dressing," must be received by the undersigned by the 7th APRIL 1961.

L. STOTT,
Clerk of the Council.

Town Hall,
Chadderton.

10th March, 1961.

ESHER URBAN DISTRICT COUNCIL.

LAYING OF HARDWARE AND CLINKER ROADWAYS
ON ALLOTMENT SITES.

CONTRACT NO. 314.

TENDERS are invited for the work of LAYING approximately 6,300 sq. yd. of HARDWARE, CLINKER and ASH ROADWAYS ON ALLOTMENT SITES in the URBAN DISTRICT AREA.

Form of Tender, Specification and Bills of Quantities may be obtained from the Engineer and Surveyor and Planning Officer, Council Offices, High Street, Esher, on payment of £1 1s., which will be refunded on receipt of a bona-fide Tender, together with return of all documents in good condition.

Tenders, on the prescribed form, enclosed in the envelope provided endorsed "Contract No. 314," and bearing no name or mark indicating the sender, must be returned to the undersigned not later than 5 p.m. on TUESDAY, the 11th April, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

FREDERICK EDWARDS,
Clerk of the Council.

Council Offices,
Esher,
Surrey.

CONTRACTS

EAST SUFFOLK COUNTY COUNCIL.

ERECTION OF MODERN SCHOOL AT BACTON, STOWMARKET.

The Council propose to invite FIRM-PRICE TENDERS from selected builders for the ERECTION of this SCHOOL, of some 27,000 sq. ft. floor area. Drawings, prepared under the direction of MR. E. J. CUNDLIFFE, A.R.I.B.A., County Architect, can be seen at the County Hall, Ipswich, between 9 a.m. and 5 p.m.

Building contractors wishing to tender should submit their names to the COUNTY ARCHITECT, County Hall, Ipswich, before the 6th April, 1961. From the names submitted a number of builders will be selected and these will be furnished with Bills of Quantities, Drawings, etc., on or about the 14th April; builders not selected will be notified at the same time. Tenders are required by the 12th MAY, 1961.

COUNTY BOROUGH OF WIGAN.

ERECTION OF 43 DWELLINGS—DRUMMOND SQUARE SITE, LAITHWAITE HOUSING ESTATE.

The COUNCIL invites TENDERS for the PROPOSED ERECTION OF THE FOLLOWING DWELLINGS, all of Traditional Construction:

16 Type E1 Three-bedroom Houses at end of block.

23 Type E2 Three-bedroom Houses in middle and at end of block.

2 Type F1 Cottages, comprising Two Flats, One- and Two-bedroom.

The proposed dwellings are to be erected on the site of existing aluminium bungalows, which will be demolished, prior to possession of the whole of the site being given to the contractor, during the month of September, 1961.

Tenders to be on a Fixed-price Basis and on Bills of Quantities, which will be available as follows: House Bills—20th March, 1961; Site Works Bills—27th March, 1961.

These documents can be obtained on application to G. KEIGHLEY, B.Sc., Borough Engineer and Surveyor, Municipal Buildings, Library Street, Wigan, and on payment of a deposit of Two Guineas (cheques payable Wigan Corporation), which will be returned on receipt of a bona-fide Tender, received before the closing time on the last day of tendering.

Drawings, Conditions of Contract and the Council's Standing Orders may be inspected at the Office of the Borough Engineer and Surveyor during normal office hours by all persons having made the necessary application to tender.

When applying for Bills of Quantities, tenderers should also submit details of similar schemes undertaken by them, together with the names of two independent persons to whom reference can be made concerning such schemes. Evidence should be submitted at the same time that the tenderer will have the organisation and labour to carry out the work expeditiously.

Tenders must be delivered to the Office of the undersigned not later than 10 a.m. on FRIDAY, the 14th April, 1961.

ALLAN ROYLE,

Town Clerk.

Municipal Buildings, Wigan.

BOROUGH OF BARKING.

BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT.

RECONSTRUCTION OF RIPLE ROAD, A.123 (TUDOR ROAD) TO DEPT ENTRANCE AND LEVEL (CROSSING TO ESSEX ROAD).

TENDERS returnable by 9 a.m. on TUESDAY, 11th April, 1961, are invited for the REMOVAL of approximately 8,000 cu. yd. of WOOD BLOCK PAVING, the REPAIR OF DEFECTIVE CONCRETE FOUNDATIONS, where necessary, and SURFACING with TWO-COURSE HOT-ROLLED ASPHALT.

Specification, Bill of Quantities and Form of Tender can be obtained on application to the Borough Engineer and Surveyor, Town Hall, Barking, Essex.

E. R. FARR,

Town Clerk.

Town Hall, Barking.

CITY OF BATH.

PRIVATE STREET WORKS—HAVILAND GROVE, WESTON.

TENDERS are invited for the MAKING-UP OF HAVILAND GROVE, the principal works to comprise:

600 super. yd. Bituminous Macadam Carriageway.

345 super. yd. Bituminous Macadam Footway.

250 lin. yd. Kerb 2 Channel.

Specifications, Bills of Quantities and Forms of Tender obtainable from, and Plans and General Conditions inspected at the office of the City and Waterworks Engineer, Guildhall, Bath, upon deposit of £2 2s. refunded upon receipt of a bona-fide Tender.

Tender to be in official envelope and returned to the undersigned not later than 10 a.m., WEDNESDAY, 5th April, 1961.

The Council does not bind itself to accept the lowest or any Tender.

JARED E. DIXON,

Town Clerk.

Guildhall, Bath.

MANCHESTER CORPORATION WATERWORKS.

TENDERS invited for the SUPPLY and DELIVERY of the FOLLOWING:

Specification No. 101.—900yd. 18in. dia. Spun-Iron Concrete-lined Water Pipes with "Tyton" Joints, B.S.S. Class "C".

Tender Forms (returnable by 10 a.m., 6th APRIL, 1961) and Specifications, etc., obtainable from the SECRETARY, Waterworks Offices, Town Hall, Manchester, 2.

STAFFORDSHIRE FIRE BRIGADE.

TENDERS are invited for ITEMS OF UNIFORM and PERSONAL EQUIPMENT to be supplied during the year ending 31st March, 1962.

Forms of Tender and Specification can be obtained on application to the Chief Officer, Staffordshire Fire Brigade Headquarters, Firehill House, Aston, Stone, Staffs.

Completed Tender Forms must be forwarded to me, in plain sealed envelopes marked "Tender for Fire Brigade Uniform," by not later than 21st APRIL, 1961.

T. H. EVANS,

Clerk of the County Council.

County Buildings, Martin Street, Stafford.

CONTRACTS

COUNTY BOROUGH OF TYNEMOUTH.

BOROUGH SURVEYOR'S DEPARTMENT.

ASPHALT CARPETING OF CARRIAGEWAYS, 1961.

TENDERS are invited for the HOT-ROLLED ASPHALT CARPETING (machine-laid) of CERTAIN CARRIAGEWAYS, approximately 29,000 sq. yd. in area, within the County Borough.

Forms of Tender, General Conditions, and relevant documents may be obtained from the office of Lane Borough Surveyor, 16 Northumberland Square, North Shields.

Form of Tender must be returned not later than 10 a.m. on TUESDAY, 4th April, 1961.

(Signed) FRED. G. EGNER,

Town Clerk.

PRESCOT URBAN DISTRICT COUNCIL.

SURFACE DRESSING, 1961-62.

TENDERS are invited for SURFACE DRESSING upon VARIOUS ROADS within the URBAN DISTRICT of an approximate area of 23,520 sq. yd.

Details and Form of Tender may be obtained from the Engineer and Surveyor at the undermentioned address.

Tenders, in plain sealed envelopes endorsed "Surface Dressing Works," to reach the undersigned not later than WEDNESDAY, 12th April, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

F. LAMBERT,

Clerk of the Council.

Council Offices, Prescott.

8th March, 1961.

HUNTINGDON RURAL DISTRICT COUNCIL.

WATER SUPPLY TO FARMS AT THE GIDDINGS.

TENDERS are invited from suitably experienced contractors for the LAYING and JOINTING of approximately 4,000yd. of 3in. diameter ASBESTOS-CEMENT WATER MAINS with SCREWED JOINTS, together with ancillary Works, in the Parishes of GREAT GIDDING, STEEPLE GIDDING and LITTLE GIDDING.

Drawings may be seen during office hours at the offices of the Consulting Engineers, MESSRS. PICK, EVERARD, KEAY AND GIMSON, 6 Millstone Lane, Leicester, from whom the Specification and Bill of Quantities may be obtained on payment of a deposit of Two Guineas, which will be returned on the receipt of a bona-fide Tender.

Tenders, on the loose form and in the envelope provided, should be delivered to the undersigned not later than 10 o'clock in the Forenoon of WEDNESDAY, 19th April.

The Council do not bind themselves to accept the lowest or any Tender.

W. MIDWOOD,

Clerk of the Council.

Council Offices, Montagu House, Huntingdon.

SOUTHAM RURAL DISTRICT COUNCIL.

RATLEY SEWERAGE.

The Council invite TENDERS from contractors having experience in similar work for this SCHEME, which consists of:

- Laying of approximately 1,300yd. of 6in. diameter S.I. Sewers, together with the Construction of relevant Manholes.
- Construction of a Sewage Disposal Works, consisting of two Septic Tanks, capacity 7,500 gallons; one Percolating Filter, 150 cu. yd.; two Humus Tanks, capacity 1,700 gallons; and a Sludge and Supernatant Water Pump Station, together with the necessary Drains, Chambers, etc.
- House Connections.

All in accordance with the Drawings, Specifications, Bill of Quantities and Conditions of Contract prepared by MESSRS. W. HERBERT BATEMAN AND PARTNERS, of Bathaston, Norwich and Westminster, the Consulting Engineers to the Council.

The Drawings, Specification, Bill of Quantities and General Conditions of Contract are available for inspection by appointment at the offices of the Council or at the Bathaston office of the Consulting Engineers during normal office hours, but technical questions can be dealt with only at the latter office.

Copies of tendering documents will be issued to intending contractors on application to MESSRS. W. HERBERT BATEMAN AND PARTNERS, Chesterfield House, Bathaston, Bath.

Applications for tendering documents must be accompanied with the names and addresses of three Engineers, under whose direction similar schemes have been carried out by the applicant, together with a deposit of £5 ss., which will be returned upon receipt of a bona-fide Tender not subsequently withdrawn.

Sealed Tenders, on the form provided in the Bill of Quantities endorsed "Ratley Sewerage Scheme," accompanied by the Bill of Quantities priced in ink, should be posted to reach the undersigned not later than the First Post on MONDAY, 10th April, 1961.

The Council do not bind themselves to accept the lowest or any Tender, and will not be responsible for any expenses incurred by those tendering.

J. I. YOUNG,

Clerk to the Council.

Council Offices, The Grange, Coventry Road, Southam, Warwickshire.

EAST SHROPSHIRE WATER BOARD.

BROSELEY WATER SUPPLY.

TENDERS are invited for the CONSTRUCTION of approximately 1,300 lin. yd. of SPUN-IRON WATER MAINS, varying in diameter from 3in. to 5in., together with Pumping Station, and incidental Works, in accordance with the Drawings, Specification and Bills of Quantities prepared by the Engineers, A. H. S. WATERS AND PARTNERS, of 25 Temple Row, Birmingham, 2.

The Drawings may be seen at, and the Conditions of Contract, Specification, Bills of Quantities and Form of Tender may be obtained from the offices of the undersigned, or of the Engineers, on or after the 13th March, 1961, on payment of a deposit of Three Guineas, which will be refunded upon receipt of a bona-fide Tender and the return of all documents.

Sealed Tenders, on the form supplied and in the endorsed envelope provided, are to be delivered to me at my offices not later than Noon on the 5th MAY, 1961.

The Board does not undertake to accept the lowest or any Tender.

GEORGE THOMAS,

Clerk of the East Shropshire Water Board.

The Grove, Shifnal, Salop.

CONTRACTS

WARWICKSHIRE COUNTY COUNCIL.

TRUNK ROAD A.5—ROAD EMBANKMENT CONSTRUCTION.

TENDERS are invited for the EXCAVATION of approx. 20,000 cu. yd. of MATERIAL to form the Embankments behind the New Abutments of the Bridge Widening carrying the A.5 over the railway at Atherstone, and for the CONSTRUCTION of approx. 150yd. of 24ft. CARRIAGEWAY, and ancillary works.

Plans may be inspected at the Office of the County Surveyor, Shire Hall, Warwick, and from whom documents can be obtained upon payment of Two Guineas deposit, refundable upon receipt of a bona-fide Tender. Tenders to be returned to the County Surveyor by Noon on 10th APRIL, 1961.

L. EDGAR STEPHENS,

Clerk of the Council.

Shire Hall, Warwick.

HEREFORDSHIRE COUNTY COUNCIL.

NEWPORT-WORCESTER TRUNK ROAD, NO. 78.

IMPROVEMENT BETWEEN PRESTON CROSS AND THE STOCKING, A.449.

TENDERS are invited for the ABOVE IMPROVEMENT, which involves Earthworks, Drainage and Carriageway Construction. The Work, in two lengths, extends over a distance of 1½ miles.

The Contract documents and a Key Plan may be obtained from the office of the County Surveyor, Portfield House, Hereford, on payment of a deposit of Five Guineas, made payable to Herefordshire County Council. This deposit will be refunded on receipt on a bona-fide Tender not subsequently withdrawn and the return of the Contract documents and Plan. The Contract Drawings may be inspected at the undersigned at the above address during normal office hours (Monday-Friday).

Tenders, in sealed envelopes, having no mark thereon indicating the sender, are to be delivered to the undersigned not later than Noon on FRIDAY, the 21st April, 1961.

R. C. HANSEN,

Clerk of the Council.

Shirehall, Hereford.

COUNTY BOROUGH OF WALSALL.

DIGBETH HIGH STREET REDEVELOPMENT.

TENDERS are invited for Phase 1, consisting of the ERECTION OF a BLOCK of 11 THREE-STORY SHOPS and OFFICES.

Tenders must be sent in a sealed envelope addressed to the Town Clerk and bearing the words "Tender for Digbeth High Street Redevelopment, Phase 1," so as to be received not later than Midday on the 24th APRIL, 1961.

Any Tender received after the time stated, or otherwise than in an envelope endorsed as required, may be rejected.

An envelope suitably addressed and endorsed will be supplied with the Form of Tender, and it is desired that this envelope be used.

The Council do not bind themselves to accept the lowest or any Tender.

Applications for Tender documents, together with a £2 2s. deposit, should be sent to the Borough Engineer and Surveyor, Council House, Walsall. The deposit will be refunded on the return of the Tender documents or the receipt of a bona-fide Tender.

M. E. HABERSHON,

Borough Engineer and Surveyor.

Council House, Walsall.

15th March, 1961.

BOROUGH OF GOSPORT.

PIPING OF MOAT AT REAR OF GOSPORT BATHS.

TENDERS are invited for the LAYING of approx. 165 lin. yd. of 21in. dia. CONCRETE TUBES and the CONSTRUCTION OF FOUR MANHOLES, together with ancillary works in connection with the above. Priced Bills of Quantities should be submitted to the Borough Engineer, The Hall, Trinity Green, Gosport, upon deposit of One Guinea, returnable on receipt of a bona-fide Tender not subsequently withdrawn, and the return of all documents.

Tender Forms should be submitted to me, in a plain sealed envelope endorsed "Tender for Piping of Moat," and should bear no mark indicating the sender. Priced Bills of Quantities should at the same time be submitted to me, in a separate envelope similarly endorsed but bearing the name of the tenderer. Both envelopes must reach my Office not later than the First Post on WEDNESDAY, 12th April, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

EDWARD ADDENBROOKE,

Town Clerk.

Town Hall, Gosport.

BOROUGH OF LEWES.

CONSTRUCTION OF ROADS AND SEWERS.

The Council propose to invite TENDERS for the CONSTRUCTION of approximately 3,500 sq. yd. of REINFORCED CONCRETE CARRIAGEWAY and 700 lin. yd. of SEWERS, together with works in connection therewith.

It is anticipated that the Specification, Bills of Quantities and Drawings will be ready in April, and firms wishing to tender should make application to the Borough Surveyor, Town Hall, Fisher Street, Lewes, not later than FRIDAY, 31st March, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

R. A. R. GRAY,

Town Clerk.

Town Hall, Lewes, Sussex.

WIGSTON URBAN DISTRICT COUNCIL.

ROAD IMPROVEMENT WORKS.

TENDERS are invited for the CARRYING OUT OF CARRIAGEWAY and FOOTPATH WORKS for the Reconstruction of KIRKDALE ROAD, South Wigston (approx. 212 lin. yd.).

Particulars, Specification and Form of Tender may be obtained from the Engineer and Surveyor at the address below on payment of a deposit of 3 3s. which is refundable on receipt of a bona-fide Tender. Cheques to be made payable to Wigston Urban District Council.

Tenders to be delivered to the undersigned, in the envelope provided, not later than 12 Noon on 13th APRIL, 1961.

W. H. GUNNING,

Clerk of the Council.

Council Offices, Bushloe House, Wigston, Leics.

CONTRACTS

COUNTY BOROUGH OF BURTON UPON TRENT.

ERECTION OF DWELLINGS—FERRY STREET HOUSING SITE AND HEATH ROAD SITE.

The CORPORATION invite TENDERS for the ERECTION OF 50 DWELLINGS and 14 GARAGES of Traditional Construction on the ABOVE-MENTIONED SITES.

Applications for Bills of Quantities and Tender Form should be made to the Borough Architect, accompanied by a deposit of £2 2s. (returnable on receipt of a bona-fide Tender not subsequently withdrawn, or the return of the documents).

The Bills will be dispatched to applicants on or about 5th April, 1961, and Tenders, in the envelopes provided, must be delivered to the undersigned not later than 3 p.m. on FRIDAY, the 8th May, 1961. Drawings and Conditions of Contract may be seen at the Borough Architect's Office.

The Corporation do not bind themselves to accept the lowest or any Tender, and persons tendering must do so at their own expense.

H. T. MEADS, Town Clerk.

Town Hall,
Burton upon Trent.
March, 1961.

CITY OF WORCESTER.

ESTATE DEVELOPMENT.

WARNDON HOUSING SITE—STAGE 2B.

FIXED-RATE TENDERS are invited for the ABOVE WORKS, which comprise: 18,500 sq. yd. Dry-bound Macadam and Lean-Mix Concrete Bases to Carriageways, with appurtenant Channels and Kerbs; 6,600 lin. yd. Stoneware and Concrete Sewers from 6in. to 27in. dia.; 400 lin. yd. 12in. dia. Spun-iron Rising Main; 2,600 lin. yd. 4in.-8in. dia. Spun-iron Water Mains.

Documents obtainable from the City Engineer and Surveyor, 22 Bridge Street, Worcester, upon payment of a Two Guineas deposit which will be returned on receipt of a bona-fide tender.

Tenders, in envelope provided, to be posted to reach the undersigned not later than MONDAY, 17th April, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

BERTRAM WEBSTER, Town Clerk.

The Guildhall,
Worcester.

URBAN DISTRICT COUNCIL OF COULSDON AND PURLEY.

COLD ASPHALT SURFACING AND ANCILLARY WORKS.

TENDERS invited for ABOVE. Bill of Quantities, Specification and Tender Forms prepared by H. M. COLINS, A.M.I.C.E., may be obtained from him at address below upon receipt of Three Guineas which will be refunded upon receipt of bona-fide Tender. Contract Conditions may be inspected at Council Offices.

Sealed Tenders, in envelopes provided, and endorsed "Tender for Cold Asphalt Surfacing," to the undersigned by First Post, TUESDAY, 4th April, 1961. The Council do not bind themselves to accept the lowest or any Tender.

ERIC F. J. FELIX, Clerk of the Council.

Council Offices,
Purley, Surrey.

CARMARTHEN RURAL DISTRICT COUNCIL.

WORKS AT LLANSTEPHAN AND LAUGHARNE.

TENDERS are invited from experienced contractors, on a Fixed-price Basis, for the CARRYING OUT of the UNDERMENTIONED WORKS:

CONTRACT 1: Llanstephan Flood Relief Culvert: (a) The Supplying, Laying and Jointing of approx. 80yd. of 24in. dia. Pipes at depths varying from 5ft. to 12ft. deep, at The Green, Llanstephan. The Pipes to be Concrete, Asbestos-cement or Armo Corrugated Iron. (b) The Construction of Two Brick and Concrete Manholes 10ft. deep, and the Fixing therein of one Tidal Flap Valve and one Penstock, both of 24in. dia.

CONTRACT 2: Sewer Extension—Gospot Street, Laugharne. The Supplying, Laying and Jointing of approx. 500yd. of 6in. dia. Glazed Stone-ware Pipes at depths varying from 3ft. 6in. to 9ft. deep, in Gardens and Carriageway at Gospot Street, together with the Construction of 14 Concrete Tube Manholes of 42in. dia.

Contractors may tender for one or both Contracts, but the Council will require both Schemes to be proceeded with simultaneously.

Plans, Specifications, Bills of Quantities, Forms of Tender and General Conditions of Contract may be obtained from G. G. THOMAS, Engineer and Surveyor, Rural District Council Offices, 3 Spilman Street, Carmarthen, on payment of a deposit fee of £2 2s. per Contract.

Tenders to be returned in plain sealed envelopes to the undersigned not later than 9 a.m. on the 12th APRIL, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

T. ERNEST WILLIAMS, Clerk of the Council.

R.D.C. Offices,
Spilman Street,
Carmarthen.
Telephone 6676.
14th March, 1961.

USK RIVER BOARD.

PLANT HIRE.

QUOTATIONS are invited for the HIRE of CIVIL ENGINEERING PLANT during the year ending 31st March, 1962. THE FOLLOWING TYPES OF PLANT will be required:

Dragline Excavators (19RB and 10RB).
Angledozer (D4 and D7).
Tractor Shovels.
Tipping Lorries.

The bulk of the work will be carried out between April and October on sites within 20 miles of Newport, Mon.

Forms of Tender and Conditions of Hire can be obtained from the undersigned.
Quotations should be received not later than the 10th APRIL, 1961.

G. McLEOD, Engineer.

The Croft,
Goldcroft Common,
Caerleon, Mon.

CONTRACTS

FLINTSHIRE COUNTY COUNCIL.

A.550—LIGHTING OF PENYMYNYDD ROUNDABOUT.

TENDERS are invited for the ABOVE, comprising Provision and Erection of one Distribution Pillar, eight Lighting Columns with 30ft. mounting height and 200-W Sodium Cut-off Lanterns, four Fluorescent Lighting Units for Advance Direction Signs, and the Wiring of eight Lighting Columns and 12 Keep Left Bollards to distribution pillar.

Tender documents obtainable from E. W. W. RICHARDS, A.M.I.C.E., A.M.I.Struct.E., A.M.I.Mun.E., County Surveyor, Llynwyrin, Mold.

Tenders, in plain sealed envelope marked "17/4 Lighting at Penymynydd," should reach the undersigned not later than Noon on MONDAY, 17th April, 1961.

W. HUGH JONES, Clerk of the County Council.

County Buildings,
Mold.

BOROUGH OF NEWCASTLE-UNDER-LYME.

HIGHWAYS ACT, 1959.

TENDERS are invited for the MAKING-UP of RATHBONE AVENUE, MAY BANK, Newcastle, Staffs. The Work comprises approximately 1,240 sq. yd. of Carriageway Excavation, Foundation and Two Coats Macadam, the Re-laying of 340 lin. yd. of Kerb, and other ancillary Works.

Plans may be inspected, and Tender documents obtained, at the office of the Borough Engineer and Surveyor, Lancaster Building, High Street, Newcastle, Staffs.

Tender forms, in duplicate, and Bills of Quantities must be returned to me not later than 12 Noon on THURSDAY, the 6th April, 1961, in a plain sealed envelope endorsed "Tender—Private Street Works, May Bank."

C. J. MORTON, Town Clerk.

CITY OF CHESTER.

RECONSTRUCTION OF SEWAGE DISPOSAL WORKS.

CONTRACT NO. 602.

It is proposed to invite TENDERS from a selected list of civil engineering contractors experienced in the construction of water-retaining structures, including Two PRIMARY DIGESTERS on piled Foundations each of 100,000 cu. ft. gross Capacity. Four 6,000 cu. ft. CONSOLIDATION TANKS: One 6,000 cu. ft. GAS-HOLDER FOUNDATION, together with an 80ft. x 40ft. BRICK CONTROL BUILDING, a Reinforced Concrete Raft with a Pump Well, and various ancillary works.

It is anticipated that the Contract documents will be ready in early May, 1961, to be returned by 12 Noon, 9th JUNE, 1961.

It is hoped, subject to Ministry approval, to start work in September, 1961, with a contract period of 18 months.

Firms wishing to be placed on the above list should forward full details of their experiences on works of a similar nature to the CITY ENGINEER, 49 Northgate Street, Chester, prior to 5th APRIL, 1961.

CITY OF CARDIFF.

CORPORATION WATERWORKS.

TENDER FOR WATER MAIN.

FIXED-PRICE TENDERS are invited for the EXCAVATION for and LAYING of approximately 13,000yd. of 10in. diameter SPUN-IRON (Concrete-lined) WATER MAINS to a new RESERVOIR, WENVOE, to ABERTHAW POWER STATION.

Contract documents may be obtained from the Water Engineer and Manager, Grefyrriars Road, Cardiff, to whom applications should be made, accompanied by a deposit of £2 2s. Cheques should be made payable to Cardiff Corporation and crossed "Not negotiable and Co." The deposit will be refunded upon receipt of a bona-fide Tender or the return of the Contract documents.

Tenders must be submitted on the form which will be provided, and enclosed with the Conditions of Tender in a small envelope marked on the outside only with the words "Tender for Abertaw/St. Lythans Water Main."

A fully priced Bill of Quantities and any documents loaned by the Corporation for the purpose of submitting a Tender, and any Drawings submitted with the Tender, must be sealed up in a separate large envelope, marked on the outside only with the name of the firm submitting the Tender.

Both these envelopes must be enclosed in a third plain sealed envelope, marked on the outside only with the words "Tender for Abertaw/St. Lythans Water Main," addressed to the undersigned and sent by Registered Post or Recorded Delivery, so as to be received not later than 1961. This envelope must not bear any name or mark indicating the identity of the tenderer.

The Corporation does not bind itself to accept the lowest or any Tender.

S. TAPPER-JONES, Town Clerk.

City Hall,
Cardiff.

March, 1961.

LYMM URBAN DISTRICT COUNCIL.

SEWERAGE AND SEWAGE DISPOSAL.

TENDERS are invited, on a Fixed-price Basis, from experienced contractors for the FOLLOWING WORKS:

(1) Sewage Pumping Stations at Statham and Sow Brook, and the Requisite Pumping Mains to deliver the sewage to a new site.
(2) A New Sewage Disposal Works, comprising Inlet Arrangements, two 40ft. dia. Sedimentation Tanks, Allocating and Dosing Chambers, four 90ft. dia. Percolating Filters, two 30ft. dia. Humus Tanks, Sludge Drying Beds, Storm Water Tanks, Pumphouse, Mess-room and Office, Outfall Sewer to the River Bollin, Access Road and General Site Works.

Drawings may be inspected, and the Contract documents obtained, on or after 4th April, 1961, from the Consulting Engineers, MESSRS. CHARLES J. LOMAX AND SON, Chartered Civil Engineers, 88 Barton Arcade, Manchester, 3, on payment of a deposit cheque for Five Guineas (cheques only, made payable to the Council), which will be refunded on receipt of a bona-fide Tender not subsequently withdrawn.

Sealed Tenders, endorsed "Lymm Sewage Disposal," are to be returned to the undersigned not later than Noon on TUESDAY, 16th May, 1961.

The lowest or any Tender will not necessarily be accepted.

G. BURNIP, Clerk of the Council.

Council Offices,
Lymm, Ches.

CONTRACTS

BEDFORDSHIRE COUNTY COUNCIL.

TENDERS are invited for the SUPPLY and DELIVERY of SOLID FUEL and FUEL OIL to various establishments under the control of the County Council for a period of one year commencing 1st May, 1961. Schedules, Forms of Tender and Conditions of Contract may be obtained from the Director of Education, Shire Hall, Bedford. Tenders, made out on the official forms only, must be posted in a plain envelope, endorsed in the top left-hand corner with the words "Tender for Solid Fuel and Fuel Oil," and addressed to the CLERK OF THE COUNTY COUNCIL, Shire Hall, Bedford, and must be received by him not later than the First Post on 8th APRIL, 1961. The Council do not bind themselves to accept the lowest or any Tender.

COUNTY COUNCIL OF DURHAM.

TENDERS invited for the SUPPLY of the FOLLOWING to CONSETT TECHNICAL COLLEGE:

- (1) Modelling and Pottery Equipment.
 - (2) Metallurgical Laboratory Equipment.
 - (3) Musical Instruments.
 - (4) Projection Equipment.
 - (5) Book-keeping Room Equipment.
- Details and Forms of Tender, returnable by 31st MARCH, 1961, from undersigned.

G. H. MITCALFE, Director of Education.

Shire Hall,
Durham.
13th March, 1961.

BOROUGH OF HARROGATE.

STREET LIGHTING EQUIPMENT—LANTERNS AND ANCILLARY CONTROL GEAR, ETC.

TENDERS are invited for the SUPPLY and DELIVERY of the FOLLOWING STREET LIGHTING EQUIPMENT:

- (a) 10 140-W Sodium Lanterns and Gear.
- (b) 65 140-W Sodium Span Lighting Lanterns and Gear.
- (c) Six Three x 80-W Fluorescent Lanterns and Gear.
- (d) Seven Three x 80-W Fluorescent Span Lighting Lanterns and Gear.
- (e) 300 60-W x 200-W Tungsten Lanterns.
- (f) 130 Time Switch Boxes.
- (g) 130 Swan-neck Brackets.
- (h) 300 Synchronous Times Switches.
- (i) 65 Control Gear Boxes.

A schedule of the Council's requirements can be obtained on application to the Borough Engineer's Office.

Sealed Tenders, in the envelope provided, should be delivered to the Borough Engineer, Municipal Offices, Harrogate, not later than 10 a.m. on WEDNESDAY, 5th April, 1961.

C. E. FELLOWS, Borough Engineer.

Municipal Offices,
Harrogate.
15th March, 1961.

BOROUGH OF PORT TALBOT.

KUNK ROAD LIGHTING—PORT TALBOT BY-PASS.

TENDERS are invited for the ABOVE SCHEME, which contains the FOLLOWING ITEMS:

- 36 35ft. Steel Columns with Double Outreach.
- 10 35ft. Steel Columns with Single Outreach.
- 45 200-W Sodium Lanterns.
- 18 Keep Left Bollards.
- 2,000yd. Lighting Cable.
- Traffic Signs.

Various Ancillary Works.

The Scheme is for the Supply, Erection, Cabling and Lighting of the above. Arrangements for Forms of Tender, Specification, Bill of Quantities may be obtained from the Borough Engineer, G. V. GRIFFITHS, on payment of a deposit of £2 2s, which will be refunded on receipt of a bona-fide Tender not subsequently withdrawn.

Plans may be inspected at the Borough Engineer's Department, for which it is requested that an appointment be made.

Completed Tenders, in a plain envelope endorsed "Port Talbot By-pass—Lighting," must be returned to the undersigned not later than Noon, 17th APRIL, 1961.

The Corporation is not bound to accept the lowest or any Tender.

W. KING DAVIES, Town Clerk.

Municipal Buildings,
Port Talbot.
9th March, 1961.

CITY AND COUNTY OF NORWICH.

WATER DEPARTMENT.

CONSTRUCTION OF REINFORCED CONCRETE WATER TOWER, CAPACITY 180,000 GALLONS. AT AYLHAM, NORWICH.

TENDERS are invited for the ABOVE WORK. Documents can be obtained from the WATER DEPARTMENT, City Hall, Norwich, NOR O1A, and a full set of Drawings can be inspected. Closing date for Tenders is FRIDAY, 21st April, 1961.

CITY OF SALFORD.

ELLOR STREET CLEARANCE AREA NO. 6.

TENDERS are invited for the DEMOLITION and SITE CLEARANCE of 414 HOUSES and Four PUBLIC HOUSES in the ABOVE CLEARANCE AREA.

Plans and Specification may be seen at, and Forms of Tender obtained from, the CITY ENGINEER AND SURVEYOR, Town Hall, Salford, 3, to whom the Tender should be returned on or before Noon, WEDNESDAY, 5th April, 1961.

STOCKPORT CORPORATION.

STOCKPORT COLLEGE FOR FURTHER EDUCATION—PHASE II.

8-STORY ELECTRICAL ENGINEERING AND COMMUNAL BLOCK.
2-STORY ASSEMBLY BLOCK.
R.C. FRAME. FILED FOUNDATIONS.

Contractors with experience and capacity to complete THIS LARGE PROJECT invited to apply for inclusion on selected list of tenderers.
Application to BOROUGH ARCHITECT, Town Hall, Stockport, by 12 Noon, 4th APRIL, 1961.
Documents will be available May.

Tenders due JUNE.

BUCKINGHAMSHIRE EDUCATION COMMITTEE.

TENDERS are invited for the PREPARATION of PLAYING FIELDS at BUCKINGHAM (Second Stage) and BLETCHLEY (including Cricket Track). Applications for tender documents should reach the CHIEF EDUCATION OFFICER, County Offices, Aylesbury, by 4th APRIL, 1961.

CONTRACTS

BOROUGH OF TWICKENHAM.
EXTERNAL PAINTING OF CORPORATION HOUSES.

TENDERS are invited for the EXTERNAL PAINTING OF HOUSES AND FLATS on 11 CORPORATION ESTATES. General Conditions and Specification may be obtained on payment of a deposit of £2 2s. to the Borough Engineer and Surveyor, Municipal Offices, Twickenham. (Prior inquiries, if desired, to Popesgrove 4465, Extension 135.)

Tenders must be enclosed in the official envelope bearing no mark indicative of sender and received by me not later than 10 a.m. on FRIDAY, 7th April, 1961.

Municipal Offices,
Twickenham.

CITY OF PETERBOROUGH.

WESTERN TRUNK SEWER—APPROX. 2½ MILES OF SEWER, 36IN.-42IN. DIA., IN TUNNEL AND OR OPEN CUT.

Contractors desiring to be included in the selected list of firms to be invited to submit TENDERS for the ABOVE WORKS are invited to make application to the City Engineer, Town Hall, Peterborough, from whom full details may be had.

C. PETER CLARKE,
Town Clerk.

STOKESLEY RURAL DISTRICT COUNCIL.

YARM SEWERAGE SCHEME.

The above-named Council invite TENDERS for the FOLLOWING:

CONTRACT NO. 1.—The Laying of 5,700 yd. of 18in. to 6in. dia. Cast-iron, Concrete and of Earthenware Pipe Sewers and 1,260 yd. of 6in. and 4in. dia. Cast-iron Rising Mains, together with Manholes, the Construction of Two Pumping Stations and a Disposal Works comprising Settling Tanks and Sludge Drying Beds.

CONTRACT NO. 2.—The Supply and Erection of Electrically Operated Sewage Pumping Plant in duplicate, the two pumps to deliver 250 gallons per minute to 100ft. head.

CONTRACT NO. 3.—The Supply and Erection of Electrically Operated Air Compressor and Ejector Plant in duplicate, the two ejectors to deliver 60 gallons per minute to 45ft. head.

Tender documents may be obtained from the Consulting Engineers, ARNOLD BROOKSBANK AND SON, 48 Sunbridge Road, Bradford, 1, on payment of a deposit of £5 5s. by cheque made payable to the Stokesley Rural District Council, for each Contract. Such deposits will be refunded on receipt of a bona-fide Tender not subsequently withdrawn, and the return of the documents.

Drawings may be inspected at the Office of the Consulting Engineers or at the Council Offices, Stokesley.

Tenders are to be on a Fixed-price Basis. Tenders, complete with priced Bills of Quantities, etc., must be delivered to the undersigned, in plain sealed envelopes, endorsed "Tenders for Yarm Sewerage—Contract No. 1" (No. 2 or No. 3, as the case may be), to reach me not later than 12 Noon on WEDNESDAY, 12th April, 1961.

The Council do not bind themselves to accept the lowest or any Tender. Any Tender acceptance will be subject to approval by the Ministry of Housing and Local Government.

By Order of the Council,
H. WYNNE POTTS,
Clerk of the Council.

Council Offices,
Stokesley,
Middleborough, Yorks.
11th March, 1961.

NEWRY NO. 2 RURAL DISTRICT COUNCIL.

COMPREHENSIVE WATER SCHEME—ZONE NO. 3. SUPPLY AND INSTALLATION OF ELECTRICALLY DRIVEN PUMPING PLANT IN TULLYMACEEVE BOOSTER STATION.

The Newry No. 2 Rural District Council invites TENDERS from experienced firms for the SUPPLY AND INSTALLATION OF DUPLICATE ELECTRICALLY DRIVEN CENTRIFUGAL PUMPS and Ancillary Equipment in a new Booster Station. The duty of each Booster Pump Set shall be 25 g.p.m. against a total head of 335ft.

Firms tendering shall submit full details of the plant proposed, with all necessary Preliminary Drawings, performance data, and details of Electrical Gear, etc.

Copies of the Contract documents may be obtained from the Council's Consulting Engineers, MESSRS. NICHOLAS O'DWYER, SON AND PARTNERS, 6 Trevor Hill, Newry, Co. Down, N. Ireland, on payment of £5 5s. deposit, refundable on receipt of a bona-fide Tender not subsequently withdrawn, and the return of the documents.

Specification, Form of Tender, Drawings, and other relevant information, enclosed in plain sealed envelope suitably endorsed and addressed to the Chairman of the Council, shall be lodged with the undersigned not later than 12 o'clock Noon on the 2nd day of MAY, 1961.

The Council does not bind itself to accept the lowest or any Tender received, and the accepted Tender will be subject to the approval of the Ministry of Health and Local Government.

(Signed) W. B. O'DONOGHUE,
Clerk of the Council.

Rural Council Offices,
Daisy Hill,
Newry.
14th March, 1961.

AYCLIFFE DEVELOPMENT CORPORATION.

CONTRACT 210—ROADS AND SEWERS. PRECINCT D.3 (PHASE III).

Applications are invited to TENDER for the ABOVE CONTRACT, which comprises the Construction of approx. 2,500 lin. yd. of Roads with Dry Stone Foundations, Concrete Garage Aprons and associated Sewers from 6in. to 18in. in dia.

Applications should reach the undersigned not later than First Post on 4th APRIL and be accompanied by a deposit of £2 2s. which will be returned on receipt of a bona-fide Tender.

The Corporation does not bind itself to accept the lowest or any Tender.

A. V. WILLIAMS,
General Manager.
Churchill House,
Newton Aycliffe,
Near Darlington.

CONTRACTS

COUNTY COUNCIL OF MIDDLESEX.
HARROW ROAD, A.404—DEADMAN'S HILL, WEMBLEY.

TENDERS are invited for the RECONSTRUCTION and WIDENING OF DEADMAN'S HILL, Wembley. The total length of the works is approx. 360 yd., and it is proposed to construct 180 yd. of Dual 24ft. Carriageways with additional lengths of 80 yd. and 100 yd. for Tapering to 30ft. wide Single Carriageway at each end.

The new Carriageway is to be constructed in 6in. Clinker Concrete Sub-base, 8in. Reinforced Concrete Base and 3½in. Hot Rolled Asphalt Surfacing. The Deceleration Lanes and Waiting Bays in the Central Reservation are to be constructed in 6in. Clinker Concrete and 12in. Reinforced Concrete Running Surface. The Con. also includes for Surface Water Drainage, Kerbing, Footways, and other ancillary works.

Contract documents can be obtained, and Plans examined, at the Offices of the County Engineer and Surveyor, Middlesex House, 30 Vauxhall Bridge Road, Westminster, S.W.1, upon deposit of £10 which is returnable on submission of a bona-fide Tender.

Tenders are to be returned to the undersigned, in the envelope provided, by not later than Noon on WEDNESDAY, 26th April, 1961.

The County Council does not bind itself to accept the lowest or any Tender.

CLERK OF THE COUNTY COUNCIL.
Guildhall,
Westminster, S.W.1.

COUNTY BOROUGH OF ROTHERHAM.

WEST BAWTRY ROAD IMPROVEMENT.

TENDERS are invited from experienced contractors for the WIDENING REALIGNMENT and RECONSTRUCTION of approx. 350 lin. yd. of WEST BAWTRY ROAD, A.631, within the County Borough of Rotherham, to an overall width of 60ft., including Earthworks, Foundations and Dense Bituminous Macadam Surfacing, Kerbing, Flagging, Surface Water and Subsoil Drainage, Fencing, Grass Verges, and ancillary works.

Specifications and Bills of Quantities may be obtained after 31st March, 1961, from E. J. MANSION, B.Eng., A.M.I.C.E., Borough Engineer, Municipal Offices, Howard Street, Rotherham, on payment of a deposit of £5 5s. (Five Guineas) which will be refunded on receipt of a bona-fide Tender not subsequently withdrawn.

Drawings may be inspected, and other information obtained, at the Offices of the Borough Engineer during normal working hours. Tenders, together with fully priced Bills of Quantities, in plain sealed envelopes endorsed "West Bawtry Road Improvement," must be delivered to the undersigned not later than 10 a.m. on TUESDAY, 18th April, 1961.

The Council does not bind itself to accept the lowest or any Tender.

JOHN S. WALL,
Town Clerk.
Municipal Offices,
Howard Street,
Rotherham.
16th March, 1961.

COUNTY BOROUGH OF SOUTH SHIELDS.

WHITELEAS BRIDGE.

TENDERS will shortly be invited from suitable contractors for the CONSTRUCTION of the ABOVE WORKS which comprise the FOLLOWING:

Bridge.—The Removal of the existing Decking and Replacement by Reinforced Concrete Precast Beams of the present bridge, 24ft. span, on Road B.1298, over the main Sunderland-South Shields railway line. The existing Abutments will be retained, but additional Foundations and Reinforced Concrete Piers and Columns are required.

Road Works.—The existing Road and Pavements will be raised in level, and the Approaches Regraded and Widened.

Contractors fully experienced in bridge works and road construction should apply for particulars forthwith to MESSRS. L. G. MOUCHEL AND PARTNERS, Consulting Civil Engineers, 24 Claremont Place, Newcastle upon Tyne, 2, enclosing a deposit of Five Guineas made payable to South Shields Corporation which will be returned on receipt of bona-fide Tender.

Contract documents and Drawings will be issued to suitable applicants not later than the 21st March, 1961, and Tenders are to be returned not later than 12 o'clock Noon, 20th APRIL, 1961.

No Tender will be considered which is not submitted in accordance with the instructions in the Contract documents.

The Corporation do not bind themselves to accept the lowest or any Tender.

R. S. YOUNG,
Solicitor and Town Clerk.
Town Hall,
South Shields.

COUNTY BOROUGH OF BARROW-IN-FURNESS.

WATER DEPARTMENT.

22IN. DUDDON MAIN—CONNECTIONS TO NEW PIPE BRIDGES.

TENDERS are invited from experienced mainlaying contractors for CUTTING OUT the existing 22in. dia. MAIN and MAKING CONNECTIONS TO THREE NEW PIPE BRIDGES AT KIRKBY POOL, near Kirby-in-Furness, Gallopier Pool, near Foxfield and River Lickie, near Broughton-in-Furness, and for REMOVING THE PIPES and DISMANTLING THE OLD PIPE BRIDGES. Also included is the insertion of three 22in. Sluice Valves between Duddon Bridge and Askam-in-Furness.

Tender documents may be obtained from the Engineer and Manager, 102a Duke Street, Barrow-in-Furness, and Tenders, suitably endorsed, must be returned to him not later than 12 Noon, 10th APRIL, 1961.

LAWRENCE ALLEN,
Town Clerk.

BOROUGH OF BARKING.

PILED FOUNDATIONS TO FOUR HOUSING BLOCKS—SOUTHOLD DRIVE/HEPWORTH GARDENS.

TENDERS, returnable by 9 a.m., MONDAY, 17th April, 1961, are invited for the PROVISION OF PILED FOUNDATIONS, incorporating approx. 150 Concrete piles, Reinforced Concrete Ground Beams, and Suspended Floor Slabs to the above.

Copies of the General Conditions of Contract, Specification, Bill of Materials and Form of Tender are obtainable from the Office of the Borough Engineer and Surveyor, Town Hall, Barking, Essex.

E. R. FARR,
Town Clerk.
Town Hall,
Barking.

CONTRACTS

COUNTY COUNCIL OF THE WEST RIDING OF YORKSHIRE.
RECLAMATION OF DERELICT LAND AT BRUNTCLIFFE, MORLEY.

TENDERS are invited from contractors with considerable experience in earthmoving and site reclamation for the RESTORATION of the ABOVE SITE, together with the Construction of Ditches, Culvert and Fencing, and other incidental works.

Drawings, Photographs, Conditions of Tender, Specification and Form of Tender may be obtained on application, from the County Planning Officer, County Planning Department, 71 Northgate, Wakefield, on payment of a deposit of £1 which will be returnable on receipt of a bona-fide Tender. Cheques, Postal Orders, etc., must be crossed and made payable to the West Riding Treasurer.

The County Council do not bind themselves to accept the lowest or any Tender.

Tenders are to be forwarded in a plain sealed envelope endorsed "Tender—Restoration of Bruntcliffe, Morley," to the undersigned, and received at Room 50, County Hall, Wakefield, not later than the 24th APRIL, 1961.

BERNARD KENYON,
Clerk of the County Council.

BOROUGH OF SLOUGH.

WATER UNDERTAKING.

Civil Engineering contractors experienced in the construction of watertight reinforced concrete structures, and desirous of being considered for inclusion in a list of contractors to be invited about May, 1961, to submit TENDERS for the CONSTRUCTION OF A COVERED REINFORCED CONCRETE WATER TANK of approx. 500,000 gallons capacity, at DATCHET, are requested to submit their names, together with two engineering references, to the BOROUGH ENGINEER, Town Hall, Slough, Bucks., not later than 4th APRIL, 1961.

BOROUGH OF ELLESMERE PORT.

TENDERS FOR SURFACE DRESSING.

THE COUNCIL invite TENDERS for the SURFACE DRESSING of approx. 49,000 super. yd. of CARRIAGEWAYS in the Borough.

Particulars and Forms of Tender may be obtained on application to the Borough Engineer and Surveyor, Municipal Offices, Ellesmere Port.

Sealed Tenders, endorsed "Surface Dressing," must be received by me not later than 9 a.m. on TUESDAY, 4th April, 1961. Tenders received after this date will not be considered by the Council.

The Council do not bind themselves to accept the lowest or any Tender.

R. J. BERNIE,
Town Clerk.
Municipal Offices,
Ellesmere Port.

ARNOLD URBAN DISTRICT COUNCIL.

SURFACE DRESSING—1961.

TENDERS are invited from contractors with suitable mechanical plant for the SUPPLY AND SPRAYING ONLY of about 12,000 gallons of TAR on ROADS within the Urban District.

Specification and Form of Tender may be obtained from the Engineer and Surveyor, Council Offices, Arnold, Nottingham.

Tenders, in plain sealed envelopes not bearing any name or mark indicating the sender, endorsed "Surface Dressing," to be delivered to me not later than Noon on 17th APRIL, 1961.

A. H. JAMES,
Clerk.

Clerk's Office,
Arnot Hill House,
Arnold, Notts.

WELLINGBOROUGH RURAL DISTRICT COUNCIL.

EXTENSIONS TO WOLLASTON SEWAGE TREATMENT WORKS.

TENDERS are invited from suitably experienced contractors for the FOLLOWING WORK at Wollaston, near Wellingborough:

R.C. Grit Tanks, Storm Overflows, Communitator Chamber, etc.
Four 15ft. 6in. square Vertical Flow R.C. Settling Tanks.
Two 76ft. 6in. dia. R.C. Filters.
Two 15ft. 6in. square Vertical Flow R.C. Humus Tanks.

18 Concrete Sludge Drying Beds.
Pumping Station.
Modifications to existing units.

350 yd. of 15in. dia. Spin-iron Sewer.
Detail Drawings may be seen at the Offices of the Engineers, MESSRS. PICK, EVERARD, KEAY AND GIMSON, 6 Millstone Lane, Leicester, from whom the Bill of Materials and Key Plans may be obtained on payment of a deposit of Five Guineas which will be refunded on receipt of a bona-fide Tender.

Tenders, on the form supplied and in the envelope provided, are to be delivered to the undersigned not later than 10 a.m. on TUESDAY, 25th April, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

J. BAXENDALE,
Clerk of the Council.

Rural Council Offices,
20 Oxford Street,
Wellingborough,
Northants.

TYNE IMPROVEMENT COMMISSION.

10-TON RAIL-MOUNTED DIESEL/ELECTRIC CRANE.

The Tyne Improvement Commissioners invite TENDERS for the SUPPLY AND DELIVERY complete at ALBERT EDWARD DOCK, North Shields, of a STANDARD GAUGE RAIL-MOUNTED DIESEL/ELECTRIC CRANE having a jib length of 30ft. and a lifting capacity of 10 tons at minimum radius.

The Crane is to be provided with a Fully Automatic Safe Load Indicator, an Insulated Driver's Cab complete with Windscreen Wiper and Heater, engine hour meter, working lights, spring buffers, derailing beams, and four-wheel sprung carriage.

A complete Specification and Drawing should be submitted with each Tender, which should be enclosed in a sealed envelope bearing no name or mark of the sender, endorsed "Rail-mounted Diesel/Electric Crane," and addressed to the Chairman, Docks and Trade Committee, Tyne Improvement Commission, Bewick Street, Newcastle upon Tyne, 1, to arrive not later than 12th APRIL, 1961.

R. N. EGGLETON,
Secretary.

Tyne Improvement Commission,
Bewick Street,
Newcastle upon Tyne, 1.
16th March, 1961.

CONTRACTS

LEYTON CORPORATION.
MASONS AND PAVERS TWO-YEAR CONTRACT
FOR FOOTWAY WORKS.

TENDERS are invited for the ABOVE WORKS, which comprise the Taking-up and Re-laying of Kerbing and Slab Paving, together with certain Concreting Works and Cold Asphalt Surfacing Works on Trunk, Classified and District Roads in the Borough, and on certain Schemes of Minor Improvement.

Specification, Schedule of Prices and Form of Tender may be obtained from the Borough Engineer, Town Hall, Leyton, E.10, on payment of £2 2s. which will be refunded on receipt of a bona-fide Tender.

Tenders, in the official envelope provided, must be returned by 12 Noon on MONDAY, 10th April, 1961.

D. J. OSBORNE,
Town Clerk.

Town Hall,
Leyton, E.10,
14th March, 1961.

CITY OF MANCHESTER.

TENDERS invited for ELECTRICAL INSTALLATION TO AGED PERSONS' HOME, GOODIER STREET, Harpurhey.

Specification and Drawings from CITY ARCHITECT, P.O. Box 488, Town Hall.

Tenders returnable by 10th APRIL.

CITY OF MANCHESTER.

TENDERS invited for the LAYOUT of HARD TENNIS COURTS AND PAVED PARKING SPACE at DIDSBURY TRAINING COLLEGE.

Specification and Drawings from CITY ARCHITECT, P.O. Box 488, Town Hall.

Tenders returnable by 5th APRIL.

CITY OF BIRMINGHAM.

TO BUILDING CONTRACTORS.

CONTRACT 753—29 TWO-STORY DWELLINGS—WILLASTON ROAD, ELMS ESTATE, SHELDON.

The HOUSEBUILDING COMMITTEE invite TENDERS for the ERECTION of the ABOVE.

Bills of Quantities and Form of Tender will be forwarded on payment of £2 2s. at the Office of A. G. SHEPPARD IDLER, City Architect, Civic Centre, Birmingham, 1, to whom all cheques should be made payable. Applications should be made by 28th MARCH, 1961. Conditions of Contract (which include the usual Fair Wages and Conditions of Labour Clause) may be seen at the City Architect's Office during normal working hours.

The deposit will be returned on receipt of a bona-fide Tender, or on notification of inability to tender, together with the return of the documents not later than three days before the date for receipt of Tenders.

Tenders, enclosed in the envelope provided for the purpose, must be sealed and delivered to the Town Clerk's Office (Room No. B.31), Council House, Birmingham, 1, not later than 12 Noon on FRIDAY, the 28th April, 1961. Tenders received after that time will be rejected.

The Committee do not bind themselves to accept the lowest or any Tender.

T. H. PARKINSON,
Town Clerk.

Council House,
Birmingham, 1.

CITY OF STOKE - ON - TRENT.

HIGHWAYS ACT, 1959.

MAKING-UP OF PRIVATE STREETS.

- (A) KEMBALL AVENUE, FENTON, ETC.—SCHEME NOS. 898 and 899.
- (B) DEREK DRIVE, SNEYD GREEN, ETC.—SCHEME NOS. 894 and 895.
- (C) WILLIAM AVENUE, MEIR—SCHEME NO. 26.

The CORPORATION invite TENDERS for the MAKING-UP of the ABOVE STREETS.

Drawings and Conditions of Contract may be seen, and Bills of Quantities and Specifications obtained, from the City Surveyor's Department, Town Hall, Stoke-on-Trent, on payment of £3 each for (A) and (B), and £1 in respect of (C), which will be returned on receipt of a bona-fide Tender.

Tenders must be delivered to the TOWN CLERK, Town Hall, Stoke-on-Trent, in the separate envelopes provided, not later than 12 Noon on WEDNESDAY, 12th April, 1961.

HARRY TAYLOR,
Town Clerk.

BRENTWOOD URBAN DISTRICT COUNCIL.

TENDERS are invited for the BURNING-OFF AND PLANING of EXISTING CARRIAGEWAY SURFACINGS, and the SUPPLY, DELIVERY AND LAYING by Barham-Green machine of HOT ROLLED ASPHALT, PRFCOATED CHIPPINGS, TARMACADAM AND BITUMINOUS CONCRETE FOUNDATION COURSES, BITUMINOUS MACADAM and FINE COLD ASPHALT WEARING COURSES and GRAVEL MACADAM FOUNDATION AND WEARING COURSES.

Forms of Tender and Specification can be obtained from the Engineer and Surveyor, Council Offices, Brentwood.

Sealed Tenders, on the prescribed form, in envelopes endorsed "Annual Tenders," and bearing no indication of the sender, must reach me by 10th APRIL, 1961.

CLEMENT BOOTH,
Clerk of the Council.

TRENT RIVER BOARD.

RIVER TRENT—GAINSBOROUGH AREA.

RECONSTRUCTION OF FLOODBANKS BETWEEN COTTAM PUMPING STATION AND CHURCH LANEHAM.

TENDERS are invited for WORK on the RECONSTRUCTION of approx. 3½ miles of the FLOODBANK on the West Bank of the RIVER TRENT between Cottam Pumping Station and Church Laneham. The site is approx. seven miles south of Gainsborough.

The work involves the removal of approx. 100,000 cu. yd. of Topsoil, the Construction of a Floodbank from 380,000 cu. yd. of Subsoil, together with an Access Road and other ancillary work.

Contract documents obtainable from the Engineer, Trent River Board, 206 Derby Road, Nottingham, on payment of a deposit of £5 (cheques payable to the Trent River Board) which will be refunded only on receipt of a bona-fide Tender not subsequently withdrawn, and the return of the Contract documents. Applications for documents by Noon on the 5th APRIL, 1961.

IAN DRUMMOND,
Clerk of the Board.

CONTRACTS

COUNTY BOROUGH OF NEWPORT.
MAIN DRAINAGE WORKS.

TENDERS will shortly be invited from experienced contractors for the CONSTRUCTION of a REINFORCED CONCRETE PUMPING STATION and GRIT CHAMBER founded on piles, together with ancillary works. Applications are invited from firms who wish their names to be considered for inclusion in the selected list of contractors. Applicants should give lists of similar works, together with an indication of the cost, which they have recently carried out, together with the names of local authorities or other public bodies for whom such works were undertaken. Applications should reach me within two weeks of the date of this advertisement.

E. A. MIDDLE,
A.M.I.C.E., M.I.Mun.E.,
Borough Engineer.

Civic Centre,
Newport, Mon.
23rd March, 1961.

CITY OF WORCESTER.

LIVESTOCK MARKET REDEVELOPMENT—STAGE II.

TENDERS will shortly be invited for the ERECTION of the Second Stage in the REDEVELOPMENT of the LIVESTOCK MARKET. This Stage comprises new Pig Market, Offices, Cafeteria and Toilets. The total floor area of these buildings is in the region of 18,000 sq. ft.

Contractors wishing to tender for this work are asked to submit their names to the City Engineer and Surveyor, 22 Bridge Street, Worcester, by 12th APRIL, 1961, when Tender documents should be ready for issue.

BERTRAM WEBSTER,
Town Clerk.

Guildhall,
Worcester.

CLACTON URBAN DISTRICT COUNCIL.

HIGHWAYS ACT, 1959.

MEADOW WAY AND BEACH CRESCENT, JAYWICK.

TENDERS invited for CARRYING OUT ROADWORKS, comprising the Construction of approx. 730 lin. yd. of 9in. dia. Foul and Surface Water Sewers and 2,715 super. yd. of Gravel Asphalt and Bitumen Macadam Carriageways, together with Kerbing, Footways, etc.

Drawings and General Conditions of Contract may be seen at the Office of the Engineer and Surveyor, Town Hall, Clacton-on-Sea, who will supply Tender documents against a deposit of £2 2s., refundable on receipt of a bona-fide Tender.

Tender Forms, etc., must be delivered in a plain sealed envelope endorsed "Meadow Way, etc., S.W.," but bearing no name or mark indicating the sender, to the undersigned on or before 25th APRIL, 1961.

The Council do not bind themselves to accept the lowest or any Tender, and canvassing, directly or indirectly, will disqualify.

CHARLES B. HEARN,
Clerk of the Council.

Town Hall,
Clacton-on-Sea.

BATHAVON RURAL DISTRICT COUNCIL.

HOUSING SITE WORKS—WELLOW.

FIXED-PRICE TENDERS are invited from experienced civil engineering contractors for HOUSING SITE WORKS at Wellow, consisting of the following: The Demolition of existing Buildings on site, and the Construction of approx. 813 sq. yd. of Granular Base Carriageways and Footpaths; the Laying of approx. 203 lin. yd. of 6in. dia. Foul Sewer and Manholes; 68 lin. yd. of 6in. dia. and 117 lin. yd. of 9in. dia. Surface Water Sewer and Manhole; and 117 lin. yd. of 3in. dia. Water Main, together with all other ancillary work.

Tender documents may be obtained from the Office of the Engineer and Surveyor to the Council on and after Friday, 24th March, 1961, upon payment of a deposit of Two Guineas (by cheque payable to Bathavon R.D.C.), which will be refunded upon receipt of a bona-fide Tender and the return of all documents.

Tenders, in the envelopes provided, must be delivered to me by not later than Noon on TUESDAY, 11th April, 1961.

The Council does not bind itself to accept the lowest or any Tender.

S. G. FOXTON PRICE,
Clerk of the Council.

Council Offices,
Westgate Buildings,
Bath,
March, 1961.

NORTH DEVON WATER BOARD.

TAW MARSH SCHEME.

BELSTON TREATMENT WORKS AND RESERVOIR.

CONTRACTS 31C AND 31D.

TENDERS are invited from experienced contractors for the CONSTRUCTION and MAINTENANCE of a TREATMENT WORKS AND SERVICE RESERVOIR in connection with the above Water Scheme:

CONTRACT 31C—Two-storey Building 54ft. x 31ft. and Five-room Cottage, Access Roads, Siteworks, and ancillary work in connection therewith.

CONTRACT 31D—A 2,000,000-gallon Reinforced Concrete Reservoir and Contact Tank, Mainlaying and Drainage.

Forms of Tender, Bill of Quantities, General Conditions of Contract, Specification and Drawings for both Contracts may be obtained on application to the undersigned on the receipt of a deposit cheque made payable to the Board of Two Guineas (£2 2s.) which will be returned on receipt of bona-fide Tenders (not subsequently withdrawn) for both Contracts and the return of all documents issued except one copy of the Bill of Quantities.

Drawings may be inspected at the Offices of the undersigned; of the Architect, JOHN RADFORD, A.R.I.B.A., 14 Southey Road, West, Exeter; and of the Engineers, MESSRS. ROY AND RAFFETY, 9 Brewer's Green, Buckingham Gate, Westminster, S.W.1.

Tenders, enclosed in plain sealed envelopes which shall not bear any name or mark indicating the name of the sender, and endorsed "North Devon Water Board Contract 31C and 31D," must reach the undersigned not later than 10 a.m. on the 24th APRIL, 1961.

Both Contracts will be awarded to the one contractor, but the Board do not bind themselves to accept the lowest or any Tender.

R. T. SHEARS,
Clerk to the Board.

4 Barnfield Crescent,
Exeter,
Devon,
22nd March, 1961.

CONTRACTS

SURREY COUNTY COUNCIL.

TENDERS are invited for BAKING POWDER (preferably from manufacturers).

Tender Forms, obtainable from CHIEF SUPPLIES OFFICER, 3 Palace Road, Kingston-upon-Thames, to be returned not later than 12th APRIL, 1961.

COUNTY BOROUGH OF BURNLEY.

HEATING AND PLANING.

TENDERS are invited for the HEATING AND PLANING of approx. 22,000 sq. yd. of CARRIAGEWAY within the County Borough.

Tender documents may be obtained from the Borough Engineer and Surveyor, 22/24 Nicholas Street, Burnley, on payment of a deposit of £1, returnable on receipt of a bona-fide Tender.

Tenders are to be returned to the undersigned not later than 9 a.m. on MONDAY, 10th April, 1961. The Council does not bind itself to accept the lowest or any Tender.

C. V. THORNEY,
Town Clerk.

BOROUGH OF REIGATE.

EXTENSION OF THE DELL, REIGATE HILL, REIGATE, COMPRISING SIX OLD PEOPLE'S FLATLETS.

FIXED-PRICE TENDERS are invited for ONE TWO-STORY BLOCK of SIX OLD PEOPLE'S FLATLETS, based upon Bills of Quantities for Substructure and Site Works, subject to remeasurement as work proceeds, and upon lump sum for the Superstructure Plans.

Form of Tender, Specification, Bills of Quantities and Plans obtainable from the Borough Engineer and Surveyor, Town Hall, Reigate, on payment of a deposit of £2 2s. refunded upon the submission of a bona-fide Tender or the return of all Plans and documents.

Sealed Tenders, in the envelope provided and endorsed "Tender for Six Old People's Flatlets—The Dell, Reigate Hill, Reigate," must be returned to the undersigned not later than Noon on FRIDAY, 21st April, 1961.

HEBER DAVIES,
Town Clerk.

Town Hall,
Reigate,
March, 1961.

BOROUGH OF TIPTON.

GOSPEL OAK ROAD IMPROVEMENT—CONTRACT NO. 2.

TENDERS are invited for the RECONSTRUCTION of 2,300 sq. yd. of FOOTWAYS and 900 lin. yd. of KERBING, together with BURNING AND PLANING and RESURFACING 4,700 sq. yd. of CARRIAGEWAY with HOT ROLLED ASPHALT, and ancillary works, in Gospel Oak Road.

Drawings and General Conditions of Contract may be seen, and Form of Tender, Specification and Bill of Quantities may be obtained, on application to J. B. FLETCHER, A.M.I.C.E., Borough Engineer and Surveyor, Municipal Buildings, Sedgley Road West, Tipton, on payment of a deposit of Two Guineas which will be refunded on receipt of a bona-fide Tender, together with all documents. Cheques should be made payable to Tipton Corporation.

Tenders, to be returned in the envelope provided, not bearing any name or mark to indicate the sender, must reach the undersigned not later than First Post on FRIDAY, 21st April, 1961.

The Corporation does not bind itself to accept the lowest or any Tender.

K. W. MADIN,
Town Clerk.

Municipal Buildings,
Sedgley Road West,
Tipton.

BOROUGH OF HARROGATE.

MOTOR TRANSPORT BUILDING.

PRECAST CONCRETE PORTALS AND ROOFING.

TENDERS are invited for the SUPPLY AND ERECTION OF PRECAST CONCRETE PORTALS AND ASBESTOS ROOFING, including Foundation Piers, for a Single-storey Building (85ft. x 50ft. x 16ft. to eaves). Specifications and Forms of Tender may be obtained from the undersigned. Tenders must be received not later than 9 a.m. on THURSDAY, 5th April, 1961. The lowest or any Tender will not necessarily be accepted.

C. E. FELLOWS,
Borough Engineer.

Municipal Offices,
Harrogate,
16th March, 1961.

BOROUGH OF HAMPSTEAD.

Contractors wishing to TENDER for the REDECORATION of ANY of the FOLLOWING HOUSING ESTATES should apply to me by 5th APRIL, 1961, giving references:—

EXTERNAL PAINTING:—

Primrose Hill Court (103 Units).

Kilburn Gate (93 Units).

Goldsmith's Place (43 Units).

INTERNAL PAINTING:—

Templar House (Six Communal Staircases).

Contractors will be selected and the Council may add others.

B. H. WILSON,
Town Clerk (C.J.).

Town Hall,
Haverstock Hill, N.W.3.

CITY OF PETERBOROUGH.

TENDER FOR COMPRESSOR.

TENDERS are invited for the SUPPLY of a COMPRESSOR in part exchange, suitable for highway work, delivering 125/150 cu. ft. of free air per minute. Further details from the City Engineer.

C. PETER CLARKE,
Town Clerk.

Town Hall,
Peterborough.

CITY OF SHEFFIELD.

TENDERS are invited for the UNDERMENTIONED SUPPLIES and SERVICES to all Departments of the Sheffield Corporation from May 1st, 1961, viz:—

Overalls, Workmen's Protective Clothing, Uniform Clothing and Window Cleaning.

The necessary Forms of Tender may be obtained on application to the Town Clerk, Town Hall, Sheffield, to whom completed Forms of Tender must be delivered not later than 10 a.m. on FRIDAY, 7th April, 1961.

JOHN HEYS,
Town Clerk.

Town Hall,
Sheffield,
March 23rd, 1961.

CONTRACTS

SOUTHAMPTON COUNTY BOROUGH COUNCIL.

TENDERS are invited for ALTERATIONS and INTERNAL REDECORATIONS to the BOROUGH TREASURER'S DEPARTMENT and sundry ROOMS within the CIVIC CENTRE.
Write for particulars (and Bill of Quantities) to BOROUGH ARCHITECT, Civic Centre, Southampton, by 30th MARCH, 1961. Tender returnable by 1st MAY, 1961.

BOROUGH OF SHREWSBURY.

MONKMOOR SEWAGE WORKS RECONSTRUCTION. MACHINERY CONTRACTS.

TENDERS are invited for the SUPPLY and ERECTION of the FOLLOWING ITEMS of MACHINERY:—

CONTRACT No. 6.—Sludge Pumping Machinery and Pipework.

CONTRACT No. 7.—Recirculation Pumping Machinery and Pipework.

CONTRACT No. 8.—Flow Recorders.

Contract documents for each contract may be obtained from the Borough Surveyor, Guildhall, Shrewsbury, on payment of a deposit of £2 2s. (each), returnable on receipt of a bona-fide Tender.

Sealed Tenders, in a plain envelope, endorsed as instructed, to be returned to the undersigned not later than 10 a.m. on MONDAY, 1st May, 1961.

S. R. H. LOXTON, Town Clerk.

Guildhall, Shrewsbury.

BOROUGH OF BECKENHAM.

PRIVATE STREET WORKS.

The BOROUGH COUNCIL invites TENDERS for the MAKING-UP OF BRICKLAY ROAD, COPE ROAD, LAWN ROAD, PARK ROAD, WORSLEY BRIDGE ROAD (Part).

The works comprise a total for the five streets of approx. 45,000 sq. yd. of Bituminous Carriageway Surfacing, Kerbing, Channelling, Artificial Stone Paving to Footways, Gullies and Connections, and other incidental works, together with approx. 4,800 l'n. yd. of Surface Water Sewers (9in. to 36in. dia) and Brick Manholes.

Copies of the Specification, Bills of Quantities, Forms of Tender and envelopes may be obtained, and the Drawings and General Conditions of Contract inspected, on application to JAMES DOVE, A.M.I.C.E., Borough Engineer, Town Hall, Beckenham, Kent, on payment of a deposit of £2, which will be refunded on receipt of a bona-fide Tender that is not subsequently withdrawn.

Sealed Tenders, in the plain official envelope provided, endorsed "Tender for Private Street Works," must reach the undersigned not later than 5 p.m. on FRIDAY, 14th April, 1961. Tenders received after the prescribed date and time will not be considered and the deposit will not be refunded unless a bona-fide Tender is received by the due date and time.

The Council does not bind itself to accept the lowest or any Tender.

R. WEBSTER STORR, Town Clerk.

Town Hall, Beckenham, Kent, 17th March, 1961.

BOROUGH OF ERITH.

HIGHWAYS ACT, 1959. PART IX.

LULLINGSTONE ROAD AND ALBANY ROAD, ERITH, KENT.

TENDERS are invited for the MAKING-UP of the ABOVE-MENTIONED STREETS, which total some 180 l'n. yd. in length and are 30ft. in width. The works include a Hardcore and Tarmacadam Carriageway, Artificial Stone Paving, and approx. 125 l'n. yd. of 6in. dia. S.W. Sewer in Salt Glazed Stoneware Pipes. Tender documents may be obtained from the Office of A. HARGREAVES AND PARTNERS, Architects and Surveyors, 17 Crook Log, Bexleyheath, Kent, on payment of a deposit of £2 2s. which will be refunded on receipt of a bona-fide Tender which is not subsequently withdrawn.

Tenders must be on the form provided, enclosed in a sealed envelope endorsed "Tender for Lullingstone Road and Albany Road Private Street Works," and should be delivered to the undersigned not later than 12 Noon on FRIDAY, 14th April, 1961.

The contractor must be prepared to enter into a formal contract and bond with two sureties for the due performance of the Contract.

The Council do not bind themselves to accept the lowest or any Tender.

J. A. CROMPTON, Town Clerk.

BOROUGH OF STOCKTON-ON-TEES.

ASPHALT SURFACING—1961/62.

TENDERS are invited for approx. 19,000 sq. yd. of TWO COURSE and 6,000 sq. yd. of SINGLE COURSE ROLLED ASPHALT to be laid at VARIOUS SITES within the Borough during the forthcoming year.

Tender documents may be obtained from the Borough Engineer, Municipal Buildings, Stockton-on-Tees, on payment of a deposit of £2 2s., which will be returned on receipt of a bona-fide Tender not subsequently withdrawn.

Tenders must be delivered to the undersigned, in the official envelope provided, not later than 12 Noon on MONDAY, 17th April, 1961.

JOHN B. HAWORTH, Town Clerk.

Municipal Buildings, Stockton-on-Tees.

BRADFORD CORPORATION

HEATON PUMPING STATION.

TENDERS are invited for the CONSTRUCTION of a MASONRY-FACED PUMPHOUSE with Access Road at HEATON RESERVOIR, Bradford.

Contract documents and Drawings may be inspected at any reasonable time during normal working hours, and can be obtained from the Waterworks Engineer, 50 Darley Street, Bradford, 1, on payment of a fee of £5 5s. which will be returned after receipt of a bona-fide Tender not subsequently withdrawn.

Only contractors experienced in this type of work will be considered, and a list of similar works recently executed must be submitted with the Tender.

Tenders, enclosed in plain sealed envelopes marked only with the words "Tender for Heaton Pumping Station," and not bearing any mark or name indicating the sender, must be received by the undersigned by 1st MAY, 1961.

HENRY PATTEN, Town Clerk.

Town Hall, Bradford, 1.

CONTRACTS

COUNTY BOROUGH OF READING.

SEWERAGE AND SEWAGE DISPOSAL.

R6 CONTRACT 54.

TO CIVIL ENGINEERING AND PUBLIC WORKS CONTRACTORS.

FIRM-PRICE TENDERS are invited for the LAYING of 1,600 l'n. yd. of 24in. dia. STEEL RISING MAIN between Caversham Pumping Station and Blakes Lock Pumping Station, Reading, and the Construction of Ancillary Chambers and other works. The route for the rising main includes a crossing under the River Thames.

Particulars and Specification may be obtained, and Plans inspected, at the Offices of the Consulting Engineer, MESSRS. HOWARD HUMPHREYS AND SONS, West Street, Epsom, Surrey, on and from Monday, 27th March, 1961, until Friday, 14th April, between 10 a.m. and 4 p.m. upon payment of a deposit of Five Guineas made payable to the Council, which deposit will eventually be returned to each contractor who has submitted a bona-fide Tender not subsequently withdrawn. Prints of the Contract Drawings can be obtained from the Consulting Engineer on payment to them of £1 10s. by cheque to Howard Humphreys (Services). All prints so supplied are to be returned.

Tenders, on the official form, to be delivered to the undersigned, in sealed envelopes endorsed "Tender for Caversham Rising Main—Contract 54," but bearing no name or other mark indicating the sender, not later than MONDAY, 1st May, 1961.

The Corporation does not undertake to accept the lowest or any Tender.

TOWN CLERK.

P.O. Box 17, Town Hall, Reading, Berks, 1961.

COUNTY BOROUGH OF BOURNEMOUTH.

BOROUGH ENGINEER'S DEPARTMENT.

WICK LANE—SURFACE WATER SEWER.

TENDERS are invited for the CONSTRUCTION of 360 l'n. yd. of 15in. dia. and 165 l'n. yd. of 12in. dia. CONCRETE TUBE SURFACE WATER SEWER.

Documents and Drawings obtainable from the Borough Engineer, Town Hall, Bournemouth, upon payment of One Guinea which will be refunded on receipt of a bona-fide Tender (not subsequently withdrawn) and the return of all documents.

Tenders to reach me by 13th APRIL, 1961.

A. LINDSAY CLEGG, Town Clerk.

COUNTY BOROUGH OF BOURNEMOUTH.

BOROUGH ENGINEER'S DEPARTMENT.

STREET LIGHTING EQUIPMENT.

TENDERS are invited for the SUPPLY of EQUIPMENT for 260 GROUP "A" and 2,800 GROUP "B" LIGHTING UNITS, including 1,200 Special Brackets and Spigot Boxes for Conversion of Gas Columns. Specification obtainable from Borough Engineer, Town Hall, Bournemouth, on payment of One Guinea.

Tenders to reach me by 9 a.m. on 8th APRIL, 1961.

A. LINDSAY CLEGG, Town Clerk.

CITY OF LIVERPOOL.

TENDERS invited for SUPPLYING and FIXING additional HEATING and CONVERTING BOILERS, DINGLE DALE SECONDARY MODERN SCHOOL, DINGLE DALE, Liverpool, 6. Documents from City Engineer and Surveyor, Municipal Buildings, Liverpool 2. Tenders returnable by 6th APRIL 1961.

(J.6721) THOMAS ALKER, Town Clerk.

FRIMLEY AND CAMBERLEY

URBAN DISTRICT COUNCIL.

SURFACE DRESSING—CARRIAGEWAYS.

TENDERS are invited for the SURFACE DRESSING of approx. 67,000 sq. yd. of CARRIAGEWAY within the Urban District.

Copies of the Specification, etc., may be obtained from the Engineer and Surveyor, Municipal Buildings, Camberley.

Tenders, in plain sealed envelopes endorsed "Surface Dressing," must be delivered to the undersigned not later than First Post on WEDNESDAY, 12th April, 1961.

The Council does not bind itself to accept the lowest or any Tender.

K. S. HARVEY, Clerk of the Council.

Municipal Buildings, London Road, Camberley, Surrey, 17th March, 1961.

BILLINGHAM URBAN DISTRICT COUNCIL.

TOWN CENTRE DEVELOPMENT—ELEVATED CAR PARK.

FIXED-PRICE TENDERS are invited from civil engineering contractors for the ERECTION of the SUPERSTRUCTURE of a TWO-LEVEL CAR PARK at the BILLINGHAM TOWN CENTRE.

The work, which will be carried out in Reinforced Concrete, will include the Erection of 41 Frames and the Construction of an Elevated Parking Area approx. 780ft. long by 53ft. wide. This work will be carried out above a lower level car park, the sub-base of which will have been prepared by this Local Authority, who will subsequently complete the construction of the lower level parking area. The Contract will include certain ancillary works, Lighting, and Surface Heating.

General Condition of Contract and Drawings may be inspected at the Office of the Consulting Structural Engineer, MESSRS. S. CUSONS AND PARTNERS, Dastell House, Borough Road, Middlesbrough, and Specifications, Bill of Quantities and Forms of Tender may be obtained from EDWIN SHAW, B.Sc.(Tech.), Hon. A.M.I.C.E., A.M.C.T., Engineer and Surveyor, at the address given below, on payment of a deposit of £5 5s. which will be returned on receipt of a bona-fide Tender.

Plans may be inspected, and documents obtained, on or after 1st April, 1961, and Tenders, in plain sealed envelopes endorsed "Tender for Car Park," must be received by the undersigned not later than Noon on WEDNESDAY, 26th April, 1961.

FRED M. DAWSON, Clerk of the Council.

Council Offices, Haverton Hill, Billingham, Co. Durham.

CONTRACTS

BOROUGH OF NEWARK-ON-TRENT.

TOLNEY LANE IMPROVEMENT AND NEWCASTLE GARDENS CAR PARK.

TENDERS invited for COMPLETION of ROAD WORKS and CAR PARK, comprising approx. 9,000 sq. yd. Foundation and Surfacing, together with Kerbing, Footpath, Drainage, Street Lighting and ancillary works.

Drawings can be inspected at and tender documents obtained from the Borough Surveyor's Office, Balderton Gate, Newark, on payment of £2 2s., returnable upon receipt of a bona-fide Tender.

Tenders, in plain sealed envelopes, to Borough Surveyor by Noon, APRIL 8th, 1961, endorsed "Road-works—Tolney Lane."

The Corporation does not bind itself to accept the lowest or any Tender.

J. H. M. GREAVES, Town Clerk.

Newark-on-Trent, 17th March, 1961.

BOROUGH OF WILLESDEN.

RESURFACING OF WILLESDEN LANE (PART), N.W.2.

TENDERS are invited for the TAKING-UP and REMOVAL of approx. 3,100 sq. yd. of WOOD BLOCKS and the PROVISION and LAYING of HOT ROLLED ASPHALT in place thereof, together with incidental works, in Willesden Lane, N.W.2.

Tender documents may be obtained from the Borough Engineer and Surveyor, Town Hall, Dyne Road, N.W.6, upon application in writing, accompanied by a deposit of Two Guineas, which deposit will be returned upon the receipt of a bona-fide Tender not subsequently withdrawn.

The sealed Tender must be submitted in the envelope provided, and must not bear any name or mark of the sender, and must reach the undersigned by not later than 10 a.m. on FRIDAY, 14th April, 1961.

The Council does not bind itself to accept the lowest or any Tender.

R. S. FORSTER, Town Clerk.

Town Hall, Dyne Road, Kilburn, N.W.6.

CITY OF YORK.

STREETS AND BUILDINGS COMMITTEE.

TENDERS are invited for the CONSTRUCTION of a ROUNDABOUT at the JUNCTION of TOWER STREET, CASTLE MILLS BRIDGE and SKELDERGATE BRIDGE.

The work involves Carriageway Regrading, Relaying Footpaths, and other incidental works. The General Conditions of Contract and Drawings may be inspected at, and the Specification, Bills of Quantities and Form of Tender obtained from, the Office of the undersigned on payment of a deposit of £2 (cheque made payable to York Corporation), which will be refunded upon receipt of a bona-fide Tender not subsequently withdrawn.

The completed Form of Tender shall be delivered to the undersigned, in the official writing envelope, sealed and endorsed "Tower Street—Roundabout," not later than Noon on TUESDAY, 11th April, 1961.

The lowest or any Tender will not necessarily be accepted.

CHAS. J. MINTER, City Engineer, Surveyor and Planning Officer.

7 St. Leonard's Place, York.

CITY AND COUNTY OF NEWCASTLE UPON TYNE.

NEWCASTLE QUAY.

THE TRADE AND COMMERCE COMMITTEE is prepared to receive TENDERS for the ERECTION of ELECTRIC TRAVELLING CRANES: one 40-ton, two 10-ton and two 6-ton, of high gantry type, for use on the new quay at present being built east of the GUSEBURN.

Further particulars may be obtained from the City Engineer, Town Hall, Newcastle, to whom Tenders are to be delivered not later than MONDAY, 17th April, 1961.

The Corporation does not bind itself to accept the lowest or any Tender.

JOHN ATKINSON, Town Clerk.

Town Hall, Newcastle upon Tyne, March, 1961.

POCKLINGTON RURAL DISTRICT COUNCIL.

POCKLINGTON AND BARMBY MOOR SEWERAGE SCHEME.

CONTRACT NO. 2—PUMPING PLANT.

TENDERS are invited for the SUPPLY and ERECTION at Pocklington and Barmby Moor, York-shire, of DUPLICATE 85 G.P.M. CRUDE SEWAGE PUMPS and ONE 80 G.P.M. SLUDGE PUMP complete with Electric Motors, Starters and Accessories.

Pump manufacturers wishing to tender should apply for the documents and Drawings to the Council's Consulting Engineers, JOHN H. HAISTE AND PARTNERS, Belmont House, 20 Wood Lane, Headingly, Leeds, 6, enclosing a deposit cheque value Three Guineas made payable to the Pocklington R.D.C., such deposit to be refunded on receipt of a bona-fide Tender not subsequently withdrawn, and the return of the documents.

Tenders are to be submitted to the undersigned not later than 12 Noon on the 14th APRIL, 1961.

The Council do not bind themselves to accept the lowest or any Tender they may receive.

J. STANLEY BROWN, Clerk to the Council.

Grove House, Pocklington, York, 18th March, 1961.

COVENTRY CORPORATION.

BEECHWOOD GARDENS ESTATE.

TENDERS are invited for the MAKING-UP of AINSBURY ROAD, NIGHTINGALE LANE (Part), LYNNBROOK ROAD, INGRAM, BOTT and PILKINGTON ROADS, in accordance with Private Street Works Code, Highways Act, 1959.

The work comprises approx. 3,789 yd. of Kerbing, 8,293 sq. yd. of 6in. Lean-mix Concrete Base and Surfacing, together with some Drainage Works. Documents (deposit £5) obtainable from, and completed Tenders returnable in envelope provided, to CITY ENGINEER, Council House, Coventry, by 12 Noon, 5th APRIL, 1961.

CONTRACTS

URBAN DISTRICT COUNCIL OF COLNE VALLEY.

IMPROVEMENT AT TANNERS, SLAITHWAITE.

TENDERS are invited for the RECONSTRUCTION and IMPROVEMENT at the JUNCTION of TANNERS and VARLEY ROAD, Slaithwaite, length approx. 100yd.

Tender documents may be obtained on payment of a deposit of One Guinea, returnable on receipt of a bona-fide Tender not subsequently withdrawn, from the Office of the Council's Engineer and Surveyor, Town Hall, Cross Street, Slaithwaite, near Huddersfield, and the Drawings may be inspected during office hours.

Tenders to be returned to the undersigned not later than First Post on MONDAY, 24th April, 1961. Tenders to be endorsed "Tanners Improvement" and enclosed in a plain sealed envelope.

J. W. LOMAS.

Clerk of the Council.

Town Hall,
Slaithwaite,
Huddersfield,
16th March, 1961.

CHISLEHURST AND SIDCUP URBAN DISTRICT COUNCIL.

SURFACE WATER SEWER.

LONGLANDS ROAD AND YORK AVENUE, SIDCUP.

TENDERS are invited for CONSTRUCTING about 60yd. each of 9in., 12in., 18in. and 21in. dia. SURFACE WATER SEWER, Five MANHOLES, Manholes and ancillary works. Documents from the Surveyor, Manor House, Sidcup, on payment of Two Guineas deposit. Tenders to be tendered by 17th APRIL, 1961.

T. W. FAGG.

Clerk of the Council.

Sidcup Place,
Sidcup.

LEADING ESTATE DEVELOPERS in the Home Counties who are expanding, may wish to engage **ADDITIONAL CONTRACTORS** for the ERECTION of **DWELLING HOUSES** in contracts of approx. value £100,000. Any contractors interested and who have experience of post-war housing development, should write, in confidence, when a personal interview will be arranged.

Write Box X.3844, "The Contract Journal."

QUOTATIONS are invited for the BULK EXCAVATIONS on a CONTRACT in the MANCHESTER area, comprising the Removal and Transport for a distance of approx. 400yd. of the following: (1) approx. 36,000 cu. yd. Clinker Ash; (2) approx. 64,000 cu. yd. Clay; (3) Break out and Remove, as above, approx. 26,000 super. yd. 12in. thick Concrete Slab.

Write Box X.3859, "The Contract Journal."

For Contracts received too late for
classification see page 1549

APPOINTMENTS VACANT

EASTERN NIGERIAN GOVERNMENT.

URBAN AND RURAL WATER SUPPLY.

CIVIL ENGINEERS.

APPLICATIONS are invited from candidates with either A.M.I.C.E., A.M.I.W.E. or University engineering degree, to fill VACANCIES in the Water Supply Division of the Ministry of Works, Eastern Nigeria. Candidates, over 50 or under 26 years of age, or with less than five years' post qualification experience need not apply.

Salary will depend on experience and will be in the range of £1,614 to £2,196 p.a. (inclusive of Inducement pay).

Generous leave, allowances, furnished accommodation, and free passage for self and family.

Apply, stating age, qualifications and experience, to the RECRUITMENT OFFICER, Office of the Agent-General for Eastern Nigeria, 9 Northumberland Avenue, London, W.C.2.

ROYAL COUNTY OF BERKSHIRE.

APPOINTMENTS are invited for the FOLLOWING

(1) Assistant Divisional Surveyors (3)—stationed at Abingdon, Wokingham and Ascot. Salary Scale A.P.T. II-III (£815-£1,140).

(2) Assistant Engineers (3)—Head Office, Salary Scale A.P.T. III (£960-£1,140) or IV (£1,140-£1,310).

(3) Traffic Engineer at Head Office. Salary Scale A.P.T. IV (£1,140-£1,310).

For the appointments Nos. 1 and 2, these will be made in accordance with examination qualifications and experience.

For appointment No. 3, applicants must be qualified by examination and have had experience of traffic engineering.

Further details and Forms of application obtainable from, and returnable to, the COUNTY SURVEYOR, Shire Hall, Reading, not later than 12 Noon on TUESDAY, 4th April, 1961.

CAERNARVONSHIRE COUNTY COUNCIL.

APPLICATIONS invited for POST of JUNIOR ENGINEERING ASSISTANT, A.P.T. (£545-£815).

Applicants must have completed their professional training, be competent draughtsmen, and capable of accurate surveying.

Further particulars and Application Form from CLERK OF COUNTY COUNCIL, County Offices, Caernarvon. Closing date: 4th APRIL.

CITY AND COUNTY OF NORWICH.

WATER DEPARTMENT.

ENGINEERING ASSISTANT REQUIRED for interesting programme of new works. Salary A.P.T. II (£815-£960). Subject to medical examination.

Water engineering experience an advantage but not essential. Applicants should have served a Civil Engineering apprenticeship or apprenticeship and be competent draughtsmen, possess either a University degree in Civil Engineering or Joint Part I of the Institution of Civil Engineers or of the Testamur of the Institution of Municipal Engineers.

Housing accommodation available for any married applicant not at present owner occupier.

Applications, stating age and details of education, qualifications, present and past positions, present salary and experience, together with the names and addresses of two referees, to the ENGINEER AND MANAGER, Water Department, City Hall, Norwich NOR 01A, by 30th MARCH, 1961.

APPOINTMENTS VACANT

LINDSEY (LINCOLNSHIRE) COUNTY COUNCIL.

ARCHITECT'S DEPARTMENT.

AREA CLERK OF WORKS (Grade A.P.T. II, £815-£960) REQUIRED to take charge of an area of the County covering a radius of approx. 10 miles to the west of Lincoln round to the north to 20 miles to the east of Lincoln. The person appointed will be required to live in this area, and he will be responsible for major schemes and alteration work. The post carries an essential users car allowance up to 10-h.p.

Commencing salary within the grade, dependent upon experience. N.J.C. Conditions of Service.

Canvassing will disqualify, and candidates must disclose in writing whether to their knowledge they are related to any member of senior officer of the Council.

Applications, giving age, qualifications and experience, present post and salary, and the names of two persons to whom reference can be made, to be sent to the COUNTY ARCHITECT, County Offices, Lincoln, not later than 28th MARCH, 1961.

LINDSEY COUNTY COUNCIL.

HIGHWAYS DEPARTMENT.

BRIDGE ASSISTANT REQUIRED for established post. A.P.T. III/IV (£960-£1,310 per annum). Applicants must be fully qualified, and have an interest in structural design, and be able to apply their knowledge to the construction of a reinforced concrete bridge-works. This appointment offers good experience on all types of bridges and associated works.

Local authority experience not essential. N.J.C. Service Conditions apply. Five-day week.

Applications must be received by 12th APRIL, 1961, on forms obtainable from the COUNTY SURVEYOR, County Offices, Lincoln.

16th March, 1961.

BOROUGH OF GLOSSOP.

(READVERTISEMENT.)

WORKS OF SEWERAGE AND SEWAGE DISPOSAL.

APPOINTMENT OF: (A) RESIDENT ENGINEER.

(B) INSPECTOR.

The COUNCIL invite APPLICATIONS for TWO POSTS on the construction of a large sewage disposal works, sewers, up to 30in. in dia. rising mains: two sewage pumping stations, a reinforced concrete bridge over the River Etherow, and incidental works.

(a) Resident Engineer.—The period of this contract is two years, and the salary offered is £1,800 p.a.; a higher salary may be paid to an exceptional applicant. A car allowance will be paid on the casual user scale.

The successful applicant will work under the general direction of the Council's Consulting Engineers, MESSRS. A. H. S. WATERS AND PARTNERS, and must have had considerable experience on works of the nature described.

(b) Inspector.—The period of this contract is two years, and the salary offered will be between £1,000 and £1,100 p.a. The starting salary to be in accordance with qualifications and experience.

The successful applicant will work under the direction of the Resident Engineer and the Council's Consulting Engineers, MESSRS. A. H. S. WATERS AND PARTNERS, and must have had considerable experience on works of the nature described.

Applications, endorsed "Resident Engineer" or "Inspector", stating age, experience and qualifications, accompanied by the names of two persons to whom reference may be made, must be forwarded to the undersigned so as to reach him not later than WEDNESDAY, 29th March, 1961.

Municipal Buildings,
Glossop, Derbyshire,
March, 1961.

LEYTON CORPORATION.

APPLICATIONS are invited for the APPOINTMENT of CLERK OF WORKS (civil engineering), at a salary within Grade A.P.T. I of the Salary Scales of the National Joint Council for Local Authorities Staffs, namely £545-£815 per annum, plus London weighting.

Experience of the organisation and supervision of civil engineering works, five-day week of 42 hours.

National Conditions of Service.

Apply by letter, with details of experience and names of two referees, to Borough Engineer, Town Hall, Leyton, E.10, not later than THURSDAY, 30th March, 1961.

D. J. OSBORNE,
Town Clerk.

Town Hall,
Leyton, E.10.

BATTLE RURAL DISTRICT COUNCIL.

BURWASH COMMON AND SEDLEScombe SEWERAGE SCHEMES.

APPOINTMENT OF RESIDENT ENGINEER.

APPLICATIONS are invited for the ABOVE APPOINTMENT. Salary £1,600 p.a. plus car allowance of £54 p.a. and mileage payment. Contract period 18 months.

The works are to be carried out under the direction of the Council's Consultants, MESSRS. JOHN TAYLOR AND SONS, of Artillery House, Victoria Street, Westminster, S.W.1.

Applicants must have an engineering degree and or be members of the Institution of Civil Engineers, and have had considerable experience of this type of work.

Appointment terminable by one month's notice on either side.

Applications, stating age, qualifications, present appointment, previous experience, date available for this post, and names and addresses of three referees (of whom two should be Consulting Engineers), must reach me by TUESDAY, 4th April, 1961.

Canvassing will disqualify.

N. J. HEANEY,
Clerk of the Council.

The Watch Oak,
Battle,
Sussex.

KENT RIVER BOARD.

DYMCHURCH SEA WALL IMPROVEMENT SCHEME.

INSPECTORS REQUIRED for the above Contract near Dymchurch. Applicants must be experienced in heavy civil engineering work, involving the use of large quantities of high-grade concrete, both precast and in mass. Basic wage £15 10s. per week of 44 hours, excluding meal times and travelling time. Overtime at ordinary wage rate. Reasonable cost of travelling by public transport between home and work site will be reimbursed.

Applications, in writing, to AREA ENGINEER, Kent River Board, 72 St. Dunstan's Street, Canterbury. Interviews will be at the Resident Engineer's office on the works site at Dymchurch. Approved travelling expenses for interview will be paid.

Further information can be obtained from Messrs. D. Balfour and Sons, Salary £4,400-£5,000 inclusive, according to age and experience, the appointment being subject to one month's notice on either side. Motor transport required, for which car allowance will be paid on National Joint Scale up to a maximum of 1,199 c.c. engine capacity.

Applicants must state age, details of previous experience, and names and addresses of Engineers concerned.

CHAS. EVANS,
Clerk to the Council.

Council Offices,
Dover Road,
Sandwich, Kent.

APPOINTMENTS VACANT

FLINTSHIRE COUNTY COUNCIL.

HIGHWAYS DEPARTMENT.

APPOINTMENT OF INSPECTOR—QUEENSFERRY BY-PASS SCHEME.

APPLICATIONS are invited for the APPOINTMENT of INSPECTOR, salary £900-£1,000, according to qualifications and experience, to supervise the construction by contract of the roadworks, part of the above scheme, which includes 1.7 miles of dual carriageway.

This appointment is to the Council's temporary staff for the duration of the work, which is expected to take 12 months, with a possibility of extension on other works. It is subject to one month's notice. Separation or subsistence allowance will be paid in approved cases.

Applicants should have a sound knowledge of work in all aspects of supervision and measuring-up of large contract, heavy earthworks, drainage and road construction works of all types.

Further particulars, Conditions of Service and Application Form obtainable from the CLERK OF THE COUNTY COUNCIL, County Buildings (P.O. Box No. 1), Mold. Closing date: 4th APRIL, 1961.

CITY OF CARDIFF.

CORPORATION WATERWORKS.

LLANDEGFEDD WATER SCHEME, SECTION B.

APPLICATIONS are invited for the TEMPORARY APPOINTMENT (superannuable) of ASSISTANT RESIDENT ENGINEER to be engaged upon the design and construction of river intake works, large pumping plants, large-diameter mains and treatment plant.

Candidates should have experience of similar works, and preference would be given to Corporate Members of the Institution of Civil Engineers. The commencing salary will be £1,340 p.a., subject to review on the progression of the works.

Further information on Conditions of Service concerning this appointment may be obtained from the Water Engineer and Manager, Municipal Offices, Greyfriars Road, Cardiff.

Applications, together with the names of two referees, should reach the undersigned, appropriately endorsed, not later than 15th APRIL, 1961.

S. TAPPER-JONES,
Town Clerk.

City Hall,
Cardiff,
March, 1961.

BANSTEAD URBAN DISTRICT COUNCIL.

HIGHWAYS AND WORKS SUPERINTENDENT.

APPLICATIONS are invited for this POST in the Engineer and Surveyor's Department. Salary Grade A.P.T. III (£960-£1,140) plus London Weighting.

Commencing salary according to qualifications and experience.

The Council are prepared to offer housing accommodation to the successful applicant and to assist with removal expenses.

Transport on official duties is provided by the Council.

Particulars and Application Form obtainable from the CLERK OF THE COUNCIL, The Council House, Brighton Road, Banstead, Surrey.

Closing date: 4th APRIL, 1961.

DODWORTH URBAN DISTRICT COUNCIL.

APPOINTMENT OF CLERK OF WORKS FOR HOUSING DEVELOPMENT AT GILROYD.

The above Council invites APPLICATIONS from suitably qualified persons to supervise the erection of 108 dwellings, together with road and sewer works.

In Phase 1, to be followed by further contracts of similar size.

The person appointed will be required to work under the direction of the Council's Architects, MESSRS. TURNER AND BUCKTON, Manchester.

Salary will be not less than £1,000 p.a.

The applicant must have a wide knowledge of all sections of the building industry.

No housing accommodation provided.

Applications should be made in writing to the Clerk of the Council, Council Offices, Dodworth, near Barnsley giving details of age, trade, experience, and names of two referees. The application should be forwarded so as to reach the CLERK OF THE COUNCIL not later than 10 a.m. on 30th MARCH, 1961.

GUILDFORD RURAL DISTRICT COUNCIL.

ENGINEER AND SURVEYOR'S DEPARTMENT.

DRAINAGE INSPECTOR, GRADE A.P.T. II.

APPLICATIONS are invited for the APPOINTMENT of DRAINAGE INSPECTOR, Grade A.P.T. II (£765-£960). Commencing salary according to age and experience. Permanent appointment after six months satisfactory service.

Assistance with housing in appropriate cases. 5-day week. Car allowance not exceeding 1,199 c.c. rate.

The appointment will be subject to N.J.C. Conditions of Service.

Application Forms, from the undersigned, to be returned by 14th APRIL, 1961.

J. W. SNAPE, M.I.Mun.E., M.R.S.H.,
Engineer and Surveyor.

Millmead House,
Guildford.

EASTRY RURAL DISTRICT COUNCIL.

ASH, SHOLDEN, WOODNESBOROUGH AND WORTH MAIN SEWERAGE.

RESIDENT ENGINEER.

RESIDENT ENGINEER REQUIRED to supervise construction of main sewerage scheme, contract period 18 months, under the direction of Council's Consulting Engineers, MESSRS. D. BALFOUR AND SONS, M.M.I.C.E., 131 Victoria Street, London, S.W.1.

Further applications should be made in writing not later than 8th APRIL, 1961.

Any further information can be obtained from Messrs. D. Balfour and Sons, Salary £4,400-£5,000 inclusive, according to age and experience, the appointment being subject to one month's notice on either side. Motor transport required, for which car allowance will be paid on National Joint Scale up to a maximum of 1,199 c.c. engine capacity.

Applicants must state age, details of previous experience, and names and addresses of Engineers concerned.

CHAS. EVANS,
Clerk to the Council.

Council Offices,
Dover Road,
Sandwich, Kent.

APPOINTMENTS VACANT

MINISTRY OF LABOUR.

QUANTITY SURVEYING ASSISTANTS REQUIRED by Admiralty, War Office, Air Ministry, Ministry of Works.

Posts in London, Provinces and overseas. Salaries in London for candidates with suitable experience range from £752 p.a. at age 21 to £1,188 p.a. Write for particulars of vacancies in each Department, and Forms, to MINISTRY OF LABOUR, Technical and Scientific Register, 26 King Street, London, S.W.1. (Room 403).

MINISTRY OF LABOUR.

ASSISTANT QUANTITY SURVEYORS REQUIRED by Ministry of Education, Admiralty, War Office, Air Ministry, Ministry of Works.

Posts in London, Provinces and overseas. London salaries for suitably qualified and experienced men up to £1,412 p.a. Prospects of promotion and pensionable status. Write for particulars of vacancies in each Department, and Forms, to MINISTRY OF LABOUR, Technical and Scientific Register (Room 403), 26 King Street, London, S.W.1.

CENTRAL ELECTRICITY GENERATING BOARD.

MIDLANDS PROJECT GROUP.

TEMPORARY INSPECTORS (CIVIL).

SIZEWELL NUCLEAR POWER STATION.

APPLICATIONS are invited from suitably qualified persons for the APPOINTMENT of TEMPORARY INSPECTORS (CIVIL) at Sizewell Nuclear Power Station, Suffolk.

Candidates should have a sound knowledge of reinforced concrete construction and civil engineering works.

Previous public works experience would be an advantage. The salary will be within Grade 10, Scale £1,030-£1,325 p.a., Schedule "C" of the National Joint Board Agreement.

Applications should be made on Standard Form AE 6, available from the ADMINISTRATIVE OFFICER, Midlands Project Group, P.O. Box 314, Birmingham, 30, and should be returned to him not later than 17th APRIL, 1961.

Envelopes should be marked "Confidential—Staff Vacancy No. MPG.17.61".

CITY AND COUNTY OF THE CITY OF EXETER.

APPOINTMENT OF ASSISTANT ENGINEER (MAIN DRAINAGE).

APPLICATIONS are invited for this TEMPORARY APPOINTMENT, for a period of at least two years, subject to good health and satisfactory service, at a fixed salary of £1,375 p.a. No increments will be paid.

Applicants must be Corporate Members of the Institution of Civil Engineers or hold the Testamur of the Institution of Municipal Engineers, and have had considerable experience in main drainage work.

This temporary appointment is especially to assist in carrying out the survey, design and execution of a main drainage scheme within the city.

Removal expenses will be paid, and housing accommodation will be provided if required.

Applications, on forms to be obtained from the undersigned, must be delivered not later than WEDNESDAY, 12th April.

JOHN BRIERLEY, City Engineer and Surveyor.

Municipal Offices,
7 Southdown Way,
Exeter.
15th March, 1961.

CITY OF WINCHESTER.

APPLICATIONS are invited for the POST of ENGINEERING ASSISTANT in the City Engineer's Department. Salary within Grades A.P. III-IV, and subject to the terms and conditions laid down by the Southern Provincial Council. The successful candidate will be required to pass a medical examination. This appointment is in connection with the redevelopment of the central area, which is scheduled to commence forthwith.

Applications, giving full details of training and experience, together with the names of two referees, should be addressed to the City Engineer, Guildhall, Winchester, and reach him not later than FRIDAY, 7th April, 1961.

R. H. McCALL, Town Clerk.

Guildhall,
Winchester.
16th March, 1961.

WINSLOW RURAL DISTRICT COUNCIL.

RESIDENT ENGINEER.

RESIDENT ENGINEER REQUIRED to supervise construction of sewerage and sewage disposal scheme (contract period 15 months), under the direction of the Council's Consulting Engineers, MESSRS. D. BALFOUR AND SONS, 131 Victoria Street, Westminster, London, S.W.1, to whom application should be made in writing not later than 4th APRIL, 1961. The works will commence in April, 1961. Further information can be obtained from Messrs. D. Balfour and Sons.

Salary at £1,400-£1,500 p.a., depending upon age and experience, the appointment being subject to one month's notice on either side.

Motor transport required, for which car allowance will be paid on National Joint Council Scale up to a maximum of 1,199 c.c. engine capacity.

Applicants must state age, details of previous experience, and names and addresses of Engineers concerned.

R. G. BROWN, Clerk of the Council.

GWYNEDD RIVER BOARD.

APPOINTMENT OF PLANT SUPERVISOR.

APPLICATIONS are invited from suitably qualified persons for the ABOVE POST in the Chief Engineer's Department. The duties will consist of the supervision of the Board's workshops and depot, and the maintenance of the plant operated by the Board.

The salary will be in accordance with Grade A.P.T. III (£960, rising to £1,140), the commencing salary within the grade to be determined having regard to the qualifications and experience of the successful applicant. The successful applicant will be paid a car allowance appropriate to a 10-h.p. car.

Forms of Application, obtainable from the undersigned, are returnable by 7th APRIL, 1961.

M. G. CREWE, Clerk of the Board.

Highfield,
Caernarvon.

APPOINTMENTS VACANT

EAST SUFFOLK COUNTY COUNCIL.

ROADS AND BRIDGES DEPARTMENT.

APPOINTMENT OF ASSISTANT BRIDGE ENGINEER, Grade A.P.T. IV (£1,140-£1,310), for work on trunk and county roads.

Applicants should be Graduates of the Institution of Civil Engineers or have the Testamur of the Institution of Municipal Engineers, and have had experience in the design and construction of bridges and culverts. The appointment, which is on the permanent staff, is subject to medical assessment and N.I.C. conditions. Travelling allowance for car not exceeding 10-h.p. or £1,199 c.c.

Applications, stating age, training, qualifications and experience, to be submitted with the names of three referees, to the COUNTY SURVEYOR, County Hall, Ipswich, by the 10th APRIL, 1961.

BOROUGH OF MIDDLETON.

BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT.

APPLICATIONS are invited for the UNDERMENTIONED APPOINTMENTS from persons possessing the necessary qualifications—

- (a) Senior Assistant Engineer—A.P.T. Grade IV (£1,140-£1,310 p.a.)
- (b) Senior Assistant Engineer—A.P.T. Grade III-IV (£960-£1,310 p.a.)
- (c) Senior Assistant Architect—A.P.T. Grade IV (£1,140-£1,310 p.a.)
- (d) Senior Assistant Architect—A.P.T. Grade III-IV (£960-£1,310 p.a.)

The appointments will be permanent, subject to one month's notice on either side, and to the Local Government Superannuation Acts.

Provision of housing accommodation will be considered if required.

Applications, stating age, professional qualifications, experience, and giving the names of two referees, should be submitted to the undersigned not later than Noon on TUESDAY, 11th April, 1961.

F. JOHNSTON, Town Clerk.

Town Hall,
Middletown,
Near Manchester.
16th March, 1961.

LEEDS REGIONAL HOSPITAL BOARD.

APPLICATIONS are invited for the APPOINTMENT of an ASSISTANT CLERK of WORKS having responsibility for all the mechanical and electrical engineering work in connection with the construction of a new multi-storey, prefabricated concrete framed general hospital at Huddersfield (500 beds; approx. cost £31m.). The building work commenced in March last year, and it is anticipated that site works will continue until 1965.

Commencing salary up to a maximum of £1,150 dependent on previous experience.

Applications, stating age, qualifications, previous experience, and the names of two referees, to the SECRETARY, Park Parade, Harrogate, by 7th APRIL, 1961.

CONTRACTS MANAGER REQUIRED by progressive civil engineering contractors working in the Bedfordshire and Hertford area. Excellent opportunity for right man. Car provided.—Please write stating age, experience, to Box V.3749, "The Contract Journal".

YOUNG ENGINEERS/SURVEYORS WANTED for setting-out and measurements on major earthwork contracts. Some vacancies in Staffordshire. Good terms, conditions and prospects available to suitable applicants. Interviews available in Gateshead or Staff. Write to E.D.M. DOWSETT ENGINEERING CONSTRUCTION, LTD., Dowsett House, Durham Road, Gateshead, 9.

CIVIL ENGINEERS

COSTAIN'S have a number of appointments available for men to join their civil engineering staff at starting salaries in the range £900-£1,250 per annum, plus merit bonus payment and satisfactory allowances. Applicable. Candidates should be graduate civil engineers, preferably aged 23-30. A minimum of three years' site experience is required, experience beyond this will be recognised. DAVID COSTAIN AND CO. The company's contracts cover a wide variety of heavy civil engineering works, including motorways, reservoirs, airfields, jetties and industrial constructions. Promotion prospects are better than average. The company is expanding and operates an individual staff development scheme leading to senior and managerial appointments. Frequent opportunities arise for service overseas, if desired.—Please write to:

Personnel Manager (C/2),
RICHARD COSTAIN, LTD.,
111 Westminster Bridge Road, London, S.E.1.

CONTRACTORS' PLANT.—Well-known company manufacturing and marketing specialist equipment for the constructional industries REQUIRES live REPRESENTATIVES with a knowledge of scaffolding and concrete plant to initiate an extensive sales campaign in the London and Birmingham areas. There is ample opportunity for the right men in this expanding national organisation with an exceptional range of exclusive products. These are senior appointments and only experienced men with live connections in the contracting organisations and public works departments need apply. DAVID BOWERS AND CO. (ENGINEERS), LTD., Albert Street, Oldbury, Tel.: BR044411 2941

WORKING FOREMEN REQUIRED for road, sewer and reinforced concrete contracts. These positions are ideal for first-class experienced men who now wish to settle down and work in one area. Sickness, pension, profit-sharing and production bonus schemes in operation.—Apply, giving full details, to CALIFORD AND SONS, LTD., Wolvey, Hinckley, Leics.

ASPHALT AND TARMACADAM CONTRACTS SUPERVISOR REQUIRED for Midland area. Permanent and progressive position for energetic man. Car provided, and superannuation scheme available. Apply to Personnel Manager, TARMAC ROADSTONE, LTD., Ettonhall, Wolverhampton.

CIVIL ENGINEER REQUIRED by medium-sized company in North London area. Able work own initiative and control throughout road, sewer and other contracts up to £20,000, from tendering to final certificate. Opportunity for an ambitious man who would like to finish up a Director of the company. Write, giving fullest particulars, to Box V.3774, "The Contract Journal".

A VACANCY exists with well-known building and engineering contractors in Portsmouth for a SURVEYOR with sound knowledge and experience of interim valuations, final accounts and site measuring.—Full particulars to JNO. CROAD, LTD., Portland Street, Portsmouth.

APPOINTMENTS VACANT

TARS SPRAYING FOREMAN REQUIRED for London area. Must be experienced with modern mechanical plant. Permanent job. Good wages, etc.—Write, with full details, to THE MOWLEM PAVING CO., LTD., 19 Goswoner Place, S.W.1.

SUB-AGENTS, SENIOR AND JUNIOR SITE ENGINEERS REQUIRED for civil engineering contracts in the north-west.—Write, stating age and giving details of experience, past employers, etc., to Box V.3694, "The Contract Journal".

SOUTH LANCASHIRE MOTORWAY

SIR ALFRED MCPALPINE AND SON, LTD., have vacancies for:

SECTION AGENT
SOL. MECHANICALS ENGINEERS
PLANNING ENGINEER
WORKS STUDY ENGINEERS
SETTING OUT ENGINEERS

Previous experience on contracts is essential.—Apply, in writing, to:

The Chief Engineer,
SIR ALFRED MCPALPINE AND SON, LTD.,
Hoo-on, Cheshire.

BUILDERS' ASSISTANT. Able to estimate and prepare accounts for general building. Work new, alterations, etc. Permanent and progressive position: 20 miles from London (West Essex area).—Write Box V.3750, "The Contract Journal".

GENERAL FOREMAN REQUIRED. Able to handle varied civil engineering and building contracts. Progressive position for right man.—Apply JAMES DENNIS AND SON, LTD., Knowle, Braintree, North Devon.

HUSSEY, EGAN AND PICKMERE, LTD., have vacancies for SENIOR ENGINEERING SITE STAFF on sewerage and sewage disposal works contracts in England and Wales. Applications are only invited from men with substantial previous experience of work in difficult ground conditions.—Apply in writing to 24 Calthorpe Road, Edgbaston, Birmingham, 15.

JUNIOR ENGINEER REQUIRED. Capable of setting-out and measuring a variety of civil engineering and building contracts. Transport provided.—Apply JAMES DENNIS AND SON, LTD., Knowle, Braintree, North Devon.

GENERAL FOREMAN for large brick and concrete culvert and sewer works. Birmingham area. Must be fully experienced in this type of work, heavy timbering, piling, etc.—Apply, stating age, experience, and salary required, to CURRALL, LEWIS AND MARTIN, LTD., 11 Booth Street, Handsworth, Birmingham, 21.

CUBITTS

HOLLAND & HANNEN AND CUBITTS (G.B.), LTD., have vacancies available.

SEE PAGES 1530 and 1531

WATER MAINLAYING.—Experienced AGENT Must be fully conversant with all aspects of this type of work and capable of organising and supervising more than one contract. Transport will be provided. Permanent, superannuated position for suitable applicant.—Apply in writing, giving full details of previous experience, and salary required, to ALEXANDER THOMSON AND CO. (LONDON), LTD., Yoolie's Place, Edinburgh, 15.

MEARS, BROS. (CONTRACTORS), LTD., REQUIRE ENGINEERS (aged 24-35) both for site work on civil engineering contracts in South of England and for assisting their Contracts Manager at head office in planning, design and supervision. Good prospects for keen men with previous contracting experience. Superannuation scheme in operation. Apply in writing, giving particulars of training, previous employers, and salary grade, to Personnel Manager, 154 Sodenham Road, S.E.26.

AREA AGENT REQUIRED for medium-sized contracts in Berks, Hants. Only men with experience as Agents on contracts up to £100,000 individually, or several smaller contracts over an area, will be considered. Post offers prospects of promotion to higher grades. Pension scheme. Annual bonus on results. Company car provided.—Write, stating age, details of experience, and previous employers, with salary required, to Box V.3792, "The Contract Journal".

SENIOR ENGINEER/AGENT REQUIRED to take charge of small and medium-sized contracts in an area Bucks, Oxon. Experience in control of several contracts collectively is the minimum experience required. Generous salary, car and pension scheme, and considerable scope for advancement in expanding organisation.—Write, giving details of experience, age, and salary required, to Box V.3793, "The Contract Journal".

A VACANCY EXISTS

For an experienced PROJECT MANAGER on an important civil engineering contract abroad. The work requires a man with considerable drive, high organising powers and the ability to exercise close control over a large fast-moving job. The salary offered will be commensurate with the experience and ability of applicant. Good results will be fully recognised in addition. Future prospects are assured. All letters will be acknowledged and treated in strict confidence. Write, marking envelope "Strictly Confidential," to:

"Director,"
BOX V.3805, "THE CONTRACT JOURNAL."

SENIOR SITE ENGINEER REQUIRED for roads and main drainage contracts in South of England. Applications from men able to control medium-sized contracts under supervision of an Area Agent will be considered for permanent posts offering pension scheme, car, and prospects of promotion.—Write, giving details of posts held, age, and salary required, to Box V.3794, "The Contract Journal".

THYSSEN SHAFT SINKING CO., LTD.—Due to expansion of the company's civil engineering division, exceptional opportunities exist for fully competent men in the following positions: SENIOR SITE AGENTS, SUB-AGENTS, SITE ENGINEERS—Senior and Intermediate, SITE QUANTITY SURVEYORS—Intermediate, GENERAL FOREMEN, TRADES FOREMEN, LABOUR GANGERS. These appointments are made after a suitable trial period.—Those with sewage scheme experience are particularly invited to apply to Thyssen (Ref. CGP), 42 Coombe Road, New Malden, Surrey.

APPOINTMENTS VACANT

CIVIL ENGINEERING AGENT REQUIRED for substantial contract in the Midlands area. Period of contract two years. — Write Box V.3695, "The Contract Journal."

SUPERVISOR FOR FENCING CONTRACTS, based in London area. Experience in taking working details, arranging programmes, agreeing variations and organising labour at site is necessary. Car provided. Salary according to experience. Permanent position. — Write, stating age, knowledge of the industry, and salary required, to Box V.3720, "The Contract Journal."

ESTIMATOR SURVEYOR.—Energetic top-class man wanted by small expanding building contractors in Birmingham. Must be capable of pricing and estimating for medium-sized Council and private contracts, taking site measurements and preparing interim and final valuations. Car provided. Salary according to ability and experience. — Write Box V.3787, "The Contract Journal."

SENIOR ESTIMATOR REQUIRED to work in Newcastle. Experienced in pricing bills of quantities for all types of building work up to £500,000. Good salary and conditions. — Please reply, giving details of qualifications and experience, to JOHN TWINAME, LTD., Allerdale House, Brigham, Cockermouth, Cumberland.

SENIOR AND JUNIOR SITE ENGINEERS REQUIRED for building and civil engineering contracts in London, the Midlands and North of England. Must be experienced in the use of surveying instruments and capable of controlling engineering construction. Applications, giving details of experience, age, and salary required, to the Chief Structural Engineer, TERSONS, LTD., Dollis Park, Finchley, London, N.3.

SURVEYORS and ENGINEERS

SURVEYORS and CIVIL ENGINEERS who appreciate the interest and responsibility of setting out major engineering projects, and are free to travel, can have an excellent career with:

PRECISE SURVEYS, LTD.,
40 Victoria Avenue, Worcester.
Telephone: Worcester 27584.

YOUNG CIVIL ENGINEER REQUIRED for interesting work on drilling and grouting contracts, soil investigation work, etc. Must be mobile and have a working knowledge of French. Staff position, with good prospects for man interested in specialist work. Apply in confidence, stating age, qualifications, and previous experience, to Contract Labour Department, SIMON-CARVES, LTD., Bird Hall Lane, Cheadle Heath, Stockport, quoting Ref. YE233.

SITE ENGINEERS.—Young, ambitious Engineers REQUIRED for sites in and around Bristol, Bath and Bridgwater, etc. Must be mobile and have a working knowledge of French. Good prospects. Application in detail to HARROW AND HEALES, LTD., Avon House, 8, Simonds Road, Clifton, Bristol, 8; or phone for appointment: Bristol 292826.

ENGINEER/SUB-AGENT, civil engineering contractors. Good prospects for man with drive and ambition. — Reply brief details and salary to D. S. O'BRIEN AND CO., Olive Mount, Birkenhead. Tel. 6605.

CIVIL ENGINEER/AGENT REQUIRED immediately for Birmingham area. Good salary and conditions. All replies treated in strictest confidence. — Write, giving full details, to Box V.3799, "The Contract Journal."

BUILDING SUPERVISOR, with knowledge of civil engineering, Birmingham area. Good salary and conditions. All replies treated in strictest confidence. Write Box 3800, "The Contract Journal."

TIMEKEEPER/SITE CLERK, fully experienced wages, materials, etc., REQUIRED for contracts, Manchester area. Fidelity bond required. — Write particulars and salary to Box V.3804, "The Contract Journal."

YOUNG SITE ENGINEER REQUIRED for large road and sewer scheme in Chertsey area. Must have good knowledge of instruments and be able to keep accurate measurements for certificate purposes. Excellent prospects for man of ability. Admission to superannuation scheme after satisfactory probationary period. — Write, giving full details, age, experience, salary expected, etc. to Ref. R. W. AND J. GLOSSOP, LTD., 123 East Hill, Wandsworth, S.W.18.

OVERSEAS VACANCIES FOR ENGINEERS

Vacancies exist for ENGINEERS with about 10 or more years' experience in civil engineering contracting, on an interesting project in South America. Married quarters available.

WRITE BOX V.3833, "THE CONTRACT JOURNAL."

FOREMAN and GANGERS WANTED for sewer contract, West Midlands. Top rates paid for right men. — Apply C. J. PEARCE AND CO., LTD., Southall, Dawley, Shropshire.

FIRST-CLASS SITE FITTERS REQUIRED by R. A. DAVIES (MIDLANDS), LTD., Cheslyn Hay 581. Lodge bonus and good rates. Cannock and Swadincote areas. — Write Box V.3801, "The Contract Journal."

SITE ENGINEER REQUIRED for permanent staff of civil engineering contractors operating in South-West England. Must be capable of setting-out and full control of small to medium-sized roadworks. Write, giving full details of age, experience, and salary, required, to LAWSON CONSTRUCTION (CHELTENHAM), LTD., Area Office, Bussex, Weston-zoyland, B-idgwate, Somerset.

EXPERIENCED ASSISTANT BUYER REQUIRED for firm of building contractors in the N.W. London area. Good prospects. Applicants should give details of previous experience, and salary required. — Write Box V.3803, "The Contract Journal."

SENIOR ESTIMATOR REQUIRED by building contractors whose head office is near Guildford. Applicants, who should be fully experienced, are invited to send full details of age, experience, and qualifications in confidence to Box 22,523, "The Contract Journal."

ASSISTANT SALESMAN REQUIRED for Bulldmaster Crane department. Age 20/25. Must have initiative and drive. Tower Crane selling experience desirable. Progressive position, with excellent opportunities for the right person. — Apply to Director, ABELOW AND CO. (ENGINEERS), LTD., Coventry Road, Sheldon, Birmingham, 26.

CIVIL ENGINEERS, all grades, REQUIRED for hydro-electric contract at Beauly, Inverness-shire. Apply STUART, 2275 London Road, Glasgow, E.2.

APPOINTMENTS VACANT

WILLIAM F. REES, LTD., invite applications for the following permanent staff appointments, with participation in pension and life assurance schemes. 5-day week in operation: **CHIEF ESTIMATOR** for road construction, road surfacing and masons' and paviors' work. This is a progressive position for keen and experienced men. **ASSISTANT ESTIMATOR**, to assist in the preparation of tenders for general civil engineering works. Applicants, for preference, should have some site experience and some knowledge of deep sewers in open-cut, heading and tunnel. — Replies in confidence, stating age, experience, and salary required, to William F. Rees, Ltd., 54 Victoria Street, London, S.W.1.

CONSULTING CIVIL ENGINEERS

Have vacancies for **ENGINEERING ASSISTANTS** to assist in the design of various public health engineering works. The position offers a wide opportunity of obtaining experience in various aspects of the profession, and after a qualifying period, assistants are entitled to join the firm's contributory pension scheme operated by the firm. — Applicants should write, giving details of their qualifications and experience, to:

JOHN TAYLOR AND SONS,
Artillery House, Artillery Row, London, S.W.1.

AMALGAMATED ASPHALT COMPANIES, LTD., REQUIRE an ESTIMATOR for the roads department at Birmingham. Applicants must be fully experienced in the preparation of estimates for all types of surfacing contracts involving hot rolled asphalt, bitumen and tarmacadam carpets, together with other ancillary works such as drainage, kerbing, etc. This is an excellent opportunity for the right man who has drive and ambition. — Reply in confidence, stating age, previous experience, to the Area Manager, Moor Lane, Witton, Birmingham, 6.

TAKER-OFF ASSISTANT REQUIRED in contracts materials department. Experienced taking-off building and civil engineering materials. Opportunity for young man to progress and gain all-round experience. — Send full details of age, experience, and present salary to Personnel Officer, M. J. GLEESON (CONTRACTORS), LTD., Haredon House, London Road, North Cnearn, Surrey.

SITE ENGINEERS REQUIRED for motorway construction in Kent, commencing June. Applicants must have previous experience of road and bridge construction, and apply stating qualifications, and experience, to **FREEMAN, FOX AND PARTNERS**, 25 Victoria Street, London, S.W.1.

CONTRACTS MANAGER

For reinforced products REQUIRED by **THERMALITE YONG, LTD.** Duties will include negotiating, estimating and planning, in addition to the supervision of construction of reinforced concrete and the control of direct labour. Applicants should be between 25-35 years of age. Previous experience in the erection of precast units, including associated equipment, an advantage. Should hold a current driving licence (car provided). The appointment is based at the company's main office, Hams Hall, Walsingham, but requires full mobility. It offers excellent prospects to a man of ability and initiative. Superannuation scheme. — Apply, stating age, experience, etc., to:

Group Personnel Manager (C.M.T./13/26),
JOHN LAING AND SONS, LTD.,
London, N.W.7.

QUANTITY SURVEYOR WANTED. Fully experienced Civil Engineering Site Surveyor required for measuring roads and sewer contracts. Interim and final accounts. Portsmouth district. — Apply **WARINGS (CONTRACTORS), LTD.**, London Road, Hilsa, Portsmouth.

CIVIL ENGINEER IS REQUIRED to undertake a tour as Resident Engineer in Latin America. Must be experienced in reinforced concrete and civil engineering work in Spanish. Excellent terms and conditions. — Write Box V.3810, "The Contract Journal."

GENERAL FOREMAN, experienced in reinforced concrete and general site works. Good salary and bonus paid. Permanent position for suitable man. Write Box V.3809, "The Contract Journal."

GRADUATE ENGINEER, age 22-26, REQUIRED by an expanding organisation to train in the many specialist civil, mining and drilling departments. The successful applicant should be willing to travel, and a sound knowledge of mechanical engineering would be an advantage. Salary and allowances will be in accordance with the candidate's qualifications. — Apply in writing, giving full details of experience, present salary, etc., to **FORA.S.V. LTD.**, Colwick, Nottingham.

FIRST-CLASS GANGER REQUIRED for road and sewer contract. — Please phone: Wembley 2227.

A. MONK AND CO., LTD.

REQUIRE an ESTIMATOR for work in their London office. Experience should cover both building and civil engineering works, but preference will be given to candidates of about 30 years of age with a proved civil engineering record. Superannuation scheme in operation. — Apply, in writing, with full details, to:

A. MONK AND CO., LTD.,
75 Victoria Street, London, S.W.1.

TIMEKEEPERS. — Leading firm of London contractors have vacancies for Timekeepers, preferably resident in the London area, and who have good experience in the building and civil engineering industry. Permanent appointments, with participation in bonus and superannuation schemes. — Applications, in writing, should give full particulars of age, past employment (with dates), and salary required, to Box V.3819, "The Contract Journal."

THE FALMOUTH DOCKS AND ENGINEERING COMPANY. — Applicants are invited for the appointment of ASSISTANT CIVIL ENGINEER at a salary in accordance with qualifications and experience, but not less than £1,000 p.a. The successful candidate will be superannuated under the company's scheme after a probationary period. The company is the Statutory Authority for Falmouth Docks, and the work will consist of the design and supervision of capital works and maintenance in connection with the docks installations. Applicants should be Chartered Civil Engineers, and have experience of marine civil engineering will be an advantage. — Applicants, stating age, education, qualifications and experience, should be sent as soon as possible to The Falmouth Docks and Engineering Company, The Docks, Falmouth, Cornwall.

APPOINTMENTS VACANT

TRANSPORT MANAGER REQUIRED, London area. Must have previous experience of tipping vehicles. — Phone: Ladbroke 3870.

A SENIOR TECHNICAL REPRESENTATIVE IS REQUIRED by a substantial company to specialise in plastic films as applied to civil engineering and building. The post, which will be based in London, offers considerable scope for original thought and advancement. Candidates should have experience in the civil engineering and building industry, and preferably be men between 30 and 35. — Applications, stating salary required, should be made in writing to Box V.3836, "The Contract Journal."

SENIOR ESTIMATOR REQUIRED for expanding civil engineering company. Good salary to right man with wide knowledge of civil engineering. Permanent position based at the head office. Car provided if necessary. — Write to Box V.3829, "The Contract Journal."

SITE ENGINEERS REQUIRED by firm of civil engineering contractors engaged on motorway contracts. Good salary and prospects. — Write in confidence, stating age, salary, and experience, to Box V.3830, "The Contract Journal."

STEELWORK INSPECTOR REQUIRED by Westminster consultants. Site supervision of erection within Greater London area. — Please write experience and employers to Box V.3831, "The Contract Journal."

AGENT for large sewerage scheme in Essex. Duration approx. two years, with good future prospects for right applicant. Previous experience essential. — Write, giving details, to Box V.3832, "The Contract Journal."

SENIOR BUILDING AGENT REQUIRED to take charge of a large industrial project in Southern England amounting to £1m. An excellent opportunity for a first-rate man seeking a future with a growing organisation. Remuneration, which is commensurate with the position, includes bonus and pension scheme, and use of company car. — Write, with full details, to Box V.3846, "The Contract Journal."

CONSULTING ENGINEERS

Have vacancies for **ASSISTANT ENGINEERS** for the design and detailing of works of interesting and varied nature in reinforced concrete and steelwork. Position would suit Site Engineers wanting design experience. Good salary paid in accordance with age and experience.

HENRY M. HALE AND PARTNERS,
Chartered Structural Engineers,
125 Edmund Street, Birmingham, 3.

EXCAVATOR DEMONSTRATOR DRIVER. Highly skilled and experienced Operator of outstanding ability REQUIRED to demonstrate new excavators with all equipment at works and in other parts of the United Kingdom. Excellent salary offered to the right man. Applicants required in strict confidence. Write R. H. NEAL AND CO., LTD., Dysart Works, Grantham, Lincs.

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MEASURING SURVEYORS REQUIRED for site measurements at Stevenage By-pass. — Please apply to Chief Surveyor, **MARTIN COWLEY, LTD.**, Civil Engineering Contractors, Clay Cross, Derbyshire, stating age, experience, and salary required.

JUNIOR and SITE ENGINEERS REQUIRED for civil engineering contracts in London area. — Apply in writing, giving details of experience, etc., to **KINNEAR, MOODIE AND CO., LTD.**, 299 Hither Green Lane, S.E.13.

ASSISTANT CIVIL ENGINEERS. — **RICHARD AUSTIN, LTD.**, have two vacancies for Assistant Civil Engineers. Successful candidates will be based initially at head office, but must be mobile, as they may be required to work on site for short periods during the first six months of their appointments. Transfer to site or to the design office will then be effected on a more permanent basis. Applications are invited from men, preferably aged 22-26, with at least two years' site and/or design experience. Ability to use instruments essential. — Please write to Personnel Officer, 111 Westminster Bridge Road, London, S.E.1.

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CONTRACTS MANAGER/ESTIMATOR REQUIRED. Must be experienced public works and civil engineering man to take complete control of road and drainage schemes, bulk excavations, etc., up to £100,000, within a radius of 50 miles from Bournemouth. Write full details of age, experience, and salary required, to **BOYLAND AND SON**, 869/873 Ringwood Road, West Hove, Bournemouth, Hants.

FIRST-CLASS AGENT required for a large reinforced concrete superstructure contract commencing shortly in the London area. Good salary is offered to the right man, who must possess drive, ambition and initiative. Other details such as bonus, etc., can be discussed during interview. Write in confidence, stating age, experience, and previous employers, to Box 1033, c/o Murray and Phelan, Ltd., Columbia House, Aldwych, W.C.2.

GRAYSTON PLANT AND ENGINEERING CO., LTD. require the immediate services of a young, experienced PLANT HIRE MANAGER for their Lancashire office at Haydock Lane, Haydock, St. Helens. Excellent prospects. Apply Mr. W. Haigh, General Manager, Ashton-in-Makerfield 7631.

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SIR LINDSAY PARKINSON AND CO., LTD. require a SECTION FOREMAN for the Great Ouse contract. Must be carpenter by trade. Applications in writing to the Agent, Stoke Ferry, King's Lynn, Norfolk.

DRABBLE CONSTRUCTION, LTD. require an ESTIMATOR experienced in tendering for building and civil engineering work up to £250,000. Superannuation scheme in operation. Apply, full details age, experience, salary required, to Managing Director, Drabble Construction, Ltd., 1 Cannon Street, Wellington, Northants. Telephone: Wellington 3441.

ENGINEER/AGENT required by firm of civil engineering contractors, to supervise contracts in the Hertfordshire and Bedfordshire areas. Please write, stating age, experience, etc., to Box V.3849, "The Contract Journal."

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CIVIL ENGINEER REQUIRED, with experience in road and drainage works. Permanent position offered in expanding company. Write, giving full details of experience, salary required, etc., to **KIMBELL CONSTRUCTION, LTD.**, Boughton, near Northampton.

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EXPERIENCED SITE ENGINEER REQUIRED immediately to supervise small civil engineering contracts. Apply, giving details of experience, to **CAFFIN AND CO., LTD.**, 25 Craven Street, W.C.2.

CIVIL ENGINEERING ASSISTANT required for general setting-out, levelling and measurements on road and drainage work in St. Albans area. Write in first instance, outlining experience, etc., to **COOPER BROS. (ST. ALBANS), LTD.**, Colney Heath, St. Albans, Herts.

TWO TECHNICAL SALES REPRESENTATIVES REQUIRED for Northern Counties. Must have drawing office experience in, and be conversant with, mechanical handling equipment, sand and gravel and quarry installations. Only qualified personnel with previous sales experience in this field should apply. Apply in writing only to Sales Manager, **NIAGARA SCREENS AND PLANT, LTD.**, Straysfield Road, Clay Hill, Enfield, Middlesex.

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SIR LINDSAY PARKINSON AND CO., LTD. The company seeks the services of two first-class ESTIMATORS to work in London preparing tenders for major civil engineering projects. Candidates need to have had a variety of experience and should be used to planning at the tender stage and to building up rates on this basis. These permanent appointments, which will be within the company's pension scheme, will carry attractive remuneration for men of appropriate ability. Please reply in brief in the first instance, to: The General Manager, Civil Engineering Department, SIR LINDSAY PARKINSON AND CO., LTD., 6 Lameth Road, St. George's Circus, S.E.1.

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APPOINTMENTS VACANT

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WANTED, Qualified CIVIL ENGINEER, energetic, ambitious, with experience in all aspects of civil engineering, management, estimating and good commercial sense. Salary commensurate with responsibilities. Car: bonus if justified. Applications should contain full particulars and include present earnings. They will be treated in strict confidence. Write Box V.3858, "The Contract Journal."

EXPERIENCED COST CLERK, to work mainly in N. London, and SITE CLERK for London jobs. Apply, stating age, experience, and salary required, to **FITZPATRICK AND SON (CONTRACTORS), LTD.**, 455 Old Ford Road, Bow, E.3.

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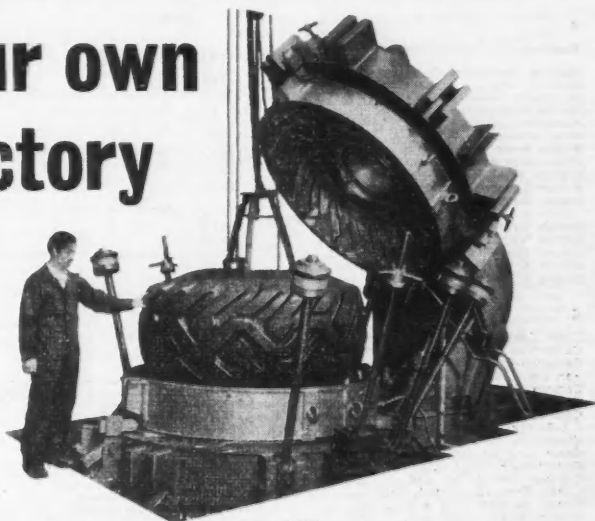


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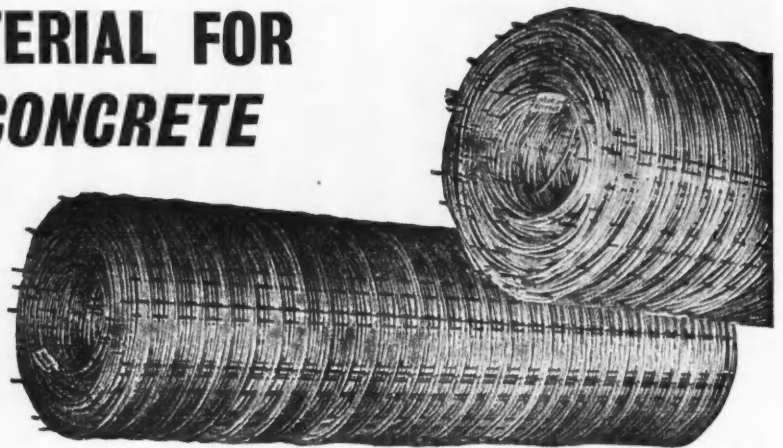
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Advertisements received too late for Classification

BOROUGH OF ROWLEY REGIS.

SUPPLY OF MATERIALS—
1ST APRIL, 1961, TO 31ST MARCH, 1962.

TENDERS are invited for the SUPPLY of the FOLLOWING MATERIALS: Road Materials, Paraffin, Bricks, etc., Stoneware, Cast-iron Work, etc., Sand, Lime, Cement, Salt and Ashes, Fuel, Petrol, Oils, Tools and Clothing, Concrete Goods, Cleaning Materials, Painters', Plumbers' and Electricians' Requisites, and Tyres and Batteries. Forms of Tender, showing Quantities, Specifications and Conditions of Contract, may be obtained from the undersigned, to whom Tenders should be delivered, in the envelope provided, not later than 12 Noon on MONDAY, the 10th April, 1961.

G. C. COOKSON,
Town Clerk.

Municipal Buildings,
Old Hill, Staffs.
20th March, 1961.

ROYTON URBAN DISTRICT COUNCIL.

CONTRACTS FOR ROAD SURFACING WORKS.
1961-62.

TENDERS are invited for the FOLLOWING:—
(a) Surface Dressing of approx. 25,500 sq. yd. of Carriageway on various Roads within the District.
(b) Hot Rolled Asphalt Surfacing to part of Shaw Road, A.663, approx. 14,400 sq. yd. of Carriageway.
Contract documents may be obtained from the Council's Engineer and Surveyor, Town Hall, Royton, Lancs.
Tenders, on the forms provided, must be returned to the undersigned in a plain sealed envelope, endorsed "Surface Dressing" or "Hot Rolled Asphalt Surfacing," not later than 5 p.m. on MONDAY, the 10th April, 1961.

A. DONALD OGDEN,
Clerk of the Council.

Town Hall,
Royton, Lancs.
20th March, 1961.

LEITCHWORTH URBAN DISTRICT COUNCIL.

STREET LIGHTING IMPROVEMENTS, 1961-62.

TENDERS are invited from experienced contractors for the REMOVAL, RESITING and CONVERSION of 93 STEEL COLUMNS, and the ERECTION of 41 Group "A" and 104 Group "B" CONCRETE COLUMNS and 16 TUBULAR STEEL GROUP "B" COLUMNS, together with the INSTALLATION of LANTERNS, GEAR, etc. Columns, lanterns, gear, etc., are being supplied under a separate contract. Documents may be obtained from E. L. JOHNSON, M.I.Mun.E., Engineer and Surveyor, Town Hall, Leitchworth, Herts., on payment of a deposit of £2 2s., which will be refunded on receipt of a bona-fide Tender.
Tenders are to be received, in the envelope provided, by Noon, 14th APRIL, 1961.
The Council do not bind themselves to accept the lowest or any Tender.

H. PLINSTON,
Clerk to the Council.

Town Hall,
Leitchworth, Herts.
20th March, 1961.

WINCHESTER RURAL DISTRICT COUNCIL.

HOUD (NETLEY) DRAINAGE.

TENDERS invited for the CONSTRUCTION of about 950 yd. of 12in. dia. CONCRETE and SPUN-IRON SEWERS, together with all necessary Manholes and incidental works.
Contract documents may be obtained from the Council's Consulting Engineers, MESSRS. LEMON AND BLIZARD, Telford House, Hulise Road, Southampton, after 4th April, 1961, upon payment of £2 by crossed cheque made payable to the Winchester Rural District Council; the cheque will be returned upon receipt of a bona-fide Tender.
Drawings and documents may be inspected at the Office of the Engineers.
Tenders, enclosed in a plain envelope bearing no indication of the sender, and endorsed "Hound (Netley) Drainage—Relief Soil Sewer," to be delivered to the undersigned by Noon on TUESDAY, 2nd May, 1961.
The Council does not bind itself to accept the lowest or any Tender.

R. W. PARTINGTON,
Clerk of the Council.

45 Romsey Road,
Winchester.

GENERAL FOREMAN, to supervise two-year sewer line contract in Worcestershire. Must have full experience in all classes of ground. Only men who can produce a good record of similar posts need apply. Write WORCESTER PLANT HIRE & CONTRACTORS, LTD., 6 Bank Street, Worcester.

CIVIL ENGINEER/AGENT REQUIRED to run a series of contracts from £5 to £50,000 in the Midlands. The contracts consist of roads, sewers, foundations, car parks and site levelling. Permanent position and good salary to right applicant. Must have previous experience.—Apply Box V.3871. "The Contract Journal."

CERAMIC TILING: ASSISTANT CONTRACTS MANAGER REQUIRED for the supervision of wall and floor tiling contracts in the Greater London area. Transport available.—Apply in writing, stating age, previous experience and salary required, to Box V.3870, "The Contract Journal."

EXPERIENCED ENGINEER REQUIRED for sewerage and sewage disposal works. Good permanent position for the right man.—Write, giving details of experience and salary required, to Box V.3869, "The Contract Journal."

SITE AGENT REQUIRED initially for large contract in the Plymouth area. Must be fully conversant in the use of a tower crane.—Write, giving details of experience and pension schemes in operation. Applicants should be prepared to travel.—Apply STAVERTON CONTRACTORS, LTD., Totnes, Devon.

BOROUGH OF RICHMOND, SURREY. For SALE, 110 pairs of 1A Appleby-Frodingham STEEL SHEET PILES, 6in. long.—Inquires to BOROUGH ENGINEER'S DEPARTMENT, King's Road, Richmond, Surrey. Tel.: RICHMOND 1133—Ext. 29.

CATERHAM AND WARLINGHAM URBAN DISTRICT COUNCIL.

CONSTRUCTION OF ACCESS ROAD, RUN-IN AND GARAGE BASE.

TENDERS are invited for the CONSTRUCTION of a short ACCESS ROAD, RUN-IN and CONCRETE BASE for a block of Three GARAGES.
Copies of the Specification, Plan and Form of Tender may be obtained on application to the Engineer and Surveyor, Council Offices, Caterham.
Tenders, in the envelope provided, are to be delivered to the undersigned not later than 4 p.m. on FRIDAY, 7th April, 1961.

B. J. SHERDON,
Clerk of the Council.

Council Offices,
Caterham.

PENGE URBAN DISTRICT COUNCIL.

DEMOLITION WORKS.

TENDERS are invited from registered demolition contractors for the DEMOLITION of Two THREE-STORY and Four TWO-STORY DWELLING HOUSES.
Contract documents may be obtained from the Office of the Engineer and Surveyor, Town Hall, Anerley Road, S.E.20, on payment of a deposit of £2, returnable on receipt of a bona-fide Tender, which is to be returned to the undersigned not later than Noon on the 17th APRIL 1961, in an envelope endorsed "Hawthorn Grove Tender."

PERCY J. BUNTING,
Clerk of the Council.

Town Hall,
Anerley Road, S.E.20.

WINCANTON RURAL DISTRICT COUNCIL.

WATER MAINS.

CUCKLINGTON TO RODGROVE STOKE TRISTER.
FIXED-PRICE TENDERS are invited for the CONSTRUCTION of approx. 6,000 lin. yd. of 3in. dia. ASBESTOS-CEMENT WATER MAINS, together with the necessary Valves and Fittings.
Tender documents may be obtained from the Engineer and Surveyor, Council Offices, Wincanton, Somerset, on payment of a deposit of Two Guineas which will be refunded on receipt of a bona-fide Tender and Tender documents.
Tenders are to be enclosed in a plain sealed envelope endorsed "Cucklington Water Supply," and must be received by the undersigned not later than First Post on MONDAY, 17th April, 1961.
The Council do not bind themselves to accept the lowest or any Tender.

S. L. CHAVE,
Clerk to the Council.

Council Offices,
Wincanton, Som.
22nd March, 1961.

THANET WATER BOARD.

DEVELOPMENT OF WOODNESBOROUGH SOURCE EXPLORATORY WORKS.

FIXED-PRICE TENDERS are invited from experienced contractors for the SINKING of ONE BORE-HOLE 24in. dia. and if, in the opinion of the Board, the yield therefrom is insufficiently successful, the SINKING NEARBY of a SECOND BOREHOLE into the chalk.
Tender documents may be obtained from the Engineer and Manager, Thanet Water Board, 58 Victoria Road, Margate, and are to be returned by Registered Post not later than 12 Noon on FRIDAY, 12th May, 1961, in a plain sealed envelope provided. The envelope must not bear any name or mark to indicate the sender.
The Board does not undertake to accept the lowest or any Tender and will not defray any expenses in tendering.

T. F. SIDNELL,
Clerk to the Board.

58 Victoria Road,
Margate, Kent.

CLERK (Male) REQUIRED, under 40. Dual-purpose function in buying and wages departments of contracting firm.—Write, stating age, experience, and salary required, to Box V.3856, "The Contract Journal."

SENIOR GENERAL FOREMAN—Applications invited for large contracts in the Midlands area building and civil engineering from fully experienced men who of recent years have carried out large important contracts with well-known national contractors. Permanency, top salary and allowances, pension and bonus schemes in operation.—Applications should state age and full details, which will be treated in confidence, to WILSON LOVATT AND SONS, LTD., Clarence Street, Wolverhampton.

SITE ENGINEER REQUIRED for road and sewer works in West Sussex area. Fitting-out experience essential.—Apply to GERALD TOYNBEE (CONTRACTORS), LTD., Barnham, near Bognor Regis, Sussex.

AN experienced REPRESENTATIVE IS REQUIRED by a leading manufacturer of construction and mechanical handling equipment for each of two territories: (1) Gloucestershire, Oxfordshire, Buckinghamshire, Wiltshire, Berkshire and Hampshire; (2) Kent, Sussex, Surrey and S. London. Considerable energy and selling ability is required to succeed in these appointments, whilst an engineering background and an existing connection in the area is preferred. Remuneration by way of salary and commission should provide initial earnings in excess of £1,100 per annum. Applicants with qualifications conforming to the above requirements should write to Box V.3860, "The Contract Journal."

CIVIL ENGINEER, qualified, REQUIRED to assist in managing a medium-sized civil engineering company in the south of England. Candidates must have had 15-20 years' experience in estimating for and in charge of general civil engineering contracts. An opportunity to take full control will arise in a few years. A full record of training and experience should be sent with application, which will be treated in confidence.—Write Box V.3868, "The Contract Journal."

WE have a vacancy for a well-informed, sound ENGINEER capable of supervising all types of road, water and sewerage contracts. Minimum age 28 years. Good references required. Prepared to settle in Worcestershire. Good prospects for right man.—Write to WORCESTER PLANT HIRE AND CONTRACTORS, LTD., 6 Bank Street, Worcester.

NATIONAL COAL BOARD.

NORTH EASTERN DIVISION.

REQUIRE

(a) **CIVIL ENGINEER** in Rotherham area to assist generally with surface reconstruction at collieries. Membership of Graduate Membership of Institution of Civil Engineers or equivalent qualification an advantage. Salary £825-£1,275.

(b) **CLERK OF WORKS** in the Doncaster area. The successful applicant must possess a sound knowledge of all building trades, and he will work under the Area Civil Engineer on the supervision of a wide variety of civil engineering and building works. He will be required to measure and agree valuations for interim and final certificates. Experience in preparation of specifications and bills of quantity an advantage. Salary £860-£1,040. Both posts are superannuable and carry concessional coal entitlements.

Write for post (a) to Area Staff Manager, No. 3 (Rotherham) Area, Wath-on-Deane, near Rotherham; and for (b) to Area Staff Manager, No. 2 (Doncaster) Area, St. George's, Thorne Road, Doncaster, by 7th APRIL.

BOROUGH OF SWINDON.

EXTERIOR REPAINTING OF 658 COUNCIL HOUSES.

TENDERS are invited from painting contractors for the ABOVE WORK at the WALCOT ESTATE, Swindon. Contract documents and Form of Tender may be obtained from the Borough Architect, Civic Offices, Swindon.

The Council does not bind itself to accept the lowest or any Tender.
Sealed Tenders, endorsed "Painting, 1961," should be delivered to the undersigned not later than 7th APRIL, 1961.

D. MURRAY JOHN,
Town Clerk.

Civic Offices,
Swindon.

FAREHAM URBAN DISTRICT COUNCIL.

ROAD WORKS.

TENDERS invited for RECONSTRUCTION of ST. MICHAEL'S GROVE, at the West End Estate, Fareham.

Works comprise the Construction of Surface Water Drainage, Carriageway Reconstruction (approx. 4,000 sq. yd. in either Reinforced Concrete or Lean-mix Concrete with Asphalt Surfacing), Kerbing and Channelling, Paving, Verges, and other incidental works.

Plans may be inspected, and Tender documents obtained from Engineer and Surveyor, Westbury Manor, West Street, Fareham, Hants., on payment of deposit of £2, refundable on receipt of bona-fide Tender.

Tenders to me by 10 a.m. on 20th APRIL, 1961; other documents to Engineer and Surveyor by same date.
The Council do not bind themselves to accept the lowest or any Tender.

B. W. RANDS,
Clerk to the Council.

Merton,
5 Grove Road,
Fareham, Hants.

CARDIFF RURAL DISTRICT COUNCIL.

WHITCHURCH BROOK IMPROVEMENT SCHEME.

FIXED-PRICE TENDERS are invited for the CONSTRUCTION of the ABOVE SCHEME, comprising the Construction of a Culvert under a Main Railway Line 30 lin. yd. long, and Concrete Channel requiring approx. 7,000 cu. yd. Excavation and 2,500 cu. yd. In-situ Concrete, together with ancillary works extending from Heol Gabriel, Whitchurch, to Beulah Crossroads, Rwbina.

The Specification, Bill of Quantities and Form of Tender may be obtained from, and the Conditions of Contract and Plans inspected at, the Office of the Council's Engineer and Surveyor, S. P. YOULDON, 20 Park Place, Cardiff, on payment of a deposit of £5 5s., which will be returned on receipt of a bona-fide Tender not subsequently withdrawn, and the return of all documents.

Tenders, addressed in plain sealed envelopes suitably endorsed but bearing no indication of the name of the sender, to be delivered to the undersigned not later than 12 Noon on THURSDAY, the 20th April, 1961.

The Council do not bind themselves to accept the lowest or any Tender.

BRYAN H. WILLIAMS,
Clerk of the Council.

Park House,
20 Park Place,
Cardiff.
20th March, 1961.

ESTIMATOR REQUIRED. Experienced man capable of pricing bills of quantities and preparing tenders for major works of building and civil engineering construction; preferably good knowledge of reinforced concrete. Good prospects for successful candidate. Apply, in writing, with full details, to Chief Surveyor, HOLLAND & HANNEN AND CUBITS (SCOTLAND), LTD., 5 Royal Terrace, Edinburgh, 7.

WATES, LTD., THE BUILDERS, have a vacancy in their land surveying department. The post requires a young man with H.N.C. or its equivalent. He must have experience of the application of land surveying to building and civil engineering, and he must be a neat and accurate draughtsman. The successful applicant will be based on the London Head Office and operate in the Greater London area. Salary will depend on experience, but will be not less than £700 per annum. Attractive extra benefits include profit-sharing bonus, subsidised meals and superannuation.—Write, giving details, to Personnel Manager, 1260 London Road, Norbury, S.W.16.

TIMEKEEPERS and CHECKERS REQUIRED for civil engineering contracts throughout the country. Apply in writing to MARTIN COWLEY, LTD., 112 Jermyn Street, S.W.1.

CIVIL ENGINEERING AGENT, qualified, with experience on general civil engineering contracts. REQUIRED to take charge of contracts for reinforced concrete frameworks for multi-storey buildings. Probably two contracts will be running at the same time, but not exceeding in value about £50,000 each. Full details of training and experience to CAMPBELL AND MCGILL, LTD., Easton Lane, Winchester.



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THE CONTRACT JOURNAL

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THE CONTRACT JOURNAL

Incorporating
THE BRITISH CONSTRUCTIONAL ENGINEER
and
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"ALL-IN" BID UNDER ATTACK

AMERICA is the home of the "all-in" bid. Opinion in this country has been sharply divided as to whether its introduction into Britain has been a desirable import or not.

It is therefore an event of some significance when a group of specialist contractors in Chicago roundly condemn the "all-in" bid system and advocate instead the "Chicago Plan" (summarised elsewhere in this issue) which is in effect, the traditional British system of dealing with sub-contracts for engineering services such as heating and ventilating work and electrical installations.

The sub-contractors providing these engineering services in Britain have already found to their cost that the "all-in" bid in which all the main contractors obtain prices for such sub-contract work can result in improper disclosure of prices, and what the Chicago specialists aptly call "bid-shopping" and "bid-peddling". Bid-shopping, it is pointed out, benefits the main contractor, not the client, while bid-peddling, or practice resorted to by disreputable sub-contractors results in inferior workmanship.

The Chicago specialist contractors go on to say that bid-shopping and bid-peddling have produced a new breed in the industry, the "broker-contractor". He is neither main contractor nor sub-contractor. The emphasis in his title lies in the word "broker" and he lives from his ability as a shrewd auctioneer. He is, say the Chicago specialists, interested solely in getting the lowest price, without any real concern for past performance, competency or integrity.

It is said that there is only one complete answer to these evils and that is the procedure based on separate bids for mechanical speciality sub-contracting. Under this system whereby the bids are returned to the client or his architect, no bidder gets to see his competitor's bid and at no time, after the opening, can he offer to reduce his bid. By the same token, say the Chicago specialists, no bidder is requested to meet a lower bid, real or imaginary, of a competitor.

The Chicago Plan advocates such separate bids (viz. the traditional British tendering system) for plumbing, heating, ventilating and electrical work. It recognises the need for the assignment of these sub-contracts to the general contractor in some instances, but adds that in such an event there should be provision for payments to be made directly to the sub-contractors to prevent general contractors in financial distress from delaying due payments to finance their own operations.

The Chicago Plan contends that extensive experience of the separate bids system shows that it produces lower costs, eliminates bid-shopping and bid-peddling, and enables competent speciality sub-contractors to be selected. It claims that most architects in the Chicago area favour separate bids and that many general contractors individually, if not collectively, have come to realise that there is a great deal of merit in bid separation from the standpoint of the general contractor.

Such a strong condemnation of the "all-in" bid system coming as stated earlier from its conceptual home, leaves much to ponder. Engineering services such as heating, ventilating and electrical installations demand a high degree of technical knowledge and skill. Tendering for them is a complicated process and the nature of the work demands that it should be placed with a reputable firm. Clearly the sub-contractors concerned have a legitimate grievance if the "all-in" bid system exposes their bids to a dutch auction and produces more tenders for the sub-contract work than for the main contract. And the client's interests may suffer if quality is sacrificed for cost.

Contract methods are changing and rightly so, in order to speed up progress and improve control and co-ordination of the various interests concerned. But the sound and incorruptible principles of the traditional British system must not be ignored. It is perhaps more a matter of improving and streamlining this system rather than embarking on something new. Otherwise instead of just eradicating the present shortcomings far greater and more sinister evils may be created.

John Sumner's Notebook . . .

ONE of the important results of the recent building wages settlement is the greater attractiveness the industry will have for school-leavers after October next. It will be particularly attractive for those youngsters who are wise enough to take pre-apprenticeship courses. These are designed to provide school-leavers with an extended period of general education and a sound, practical introduction to building.

A boy completing such a course earns remission of his first year of indentured apprenticeship. That is, he enters the industry as a second-year apprentice and serves a four-year period as an indentured apprentice instead of the normal five years.

Mr. J. W. Harper, one of the regional secretaries of the National Federation of Building Trades Operatives, argues that when the wage increases come into effect next autumn this will mean that a boy aged 16 who has completed a pre-apprenticeship course will start his apprenticeship at the age of 16 but will receive the apprentice rate for the 17-years-old, which will be £5 15s. 6d. a week, as opposed to the £3 17s. a week for the 16-years-old rate.

There is another valuable by-product of the pre-apprenticeship courses. The better training opportunities they make possible are likely to allow more craft apprentices to qualify with greater ease and, indeed, greater speed for the better paid supervisory posts after they have completed their time.

There is one snag, however. Too many employers are wriggling out of their responsibilities by declining to register their apprentices with the National Joint Apprenticeship Board. Without indentures and proper registration a youngster is being deprived of the only means he will have in later years of proving beyond all doubt that he has satisfactorily completed a period of apprenticeship in the building industry. If unemployment should come to the building trades it will be the ability of a craftsman to produce this proof to an employer that will largely determine whether he gets a job or goes on the dole.

If youngsters today are prepared to offer themselves for training as apprentices the least employers can do is to see that the training given is of the recognised kind and that the youngsters concerned are regularly and properly indentured. Without such a safeguard, of course, the boy is at a disadvantage immediately for he has no guarantee of five years' employment, little incentive to complete his training and risks wasting two or three years of training time at a crucial age in his working career.

Hitherto I have held my hand on suggesting the knock-out remedy in cases where employers just sign on apprentices and leave it at that. The position is becoming so serious, however, particularly with the bulge of school-leavers upon us, that I propose to hold my hand no longer. I therefore suggest to all the building unions that from now on they get really tough with those firms not toeing the line. They need have no fear of the outcome. A couple of good examples taken in a single locality will soon bring the other firms up to the mark. There is too much work about at the present time for it to be otherwise.

Remuneration Weakness

WHAT about the young men entering the industry as pupils and trainees? According to some information recently given by Mr. Howard Rubie, the London secretary of the Public Schools Appointments Bureau, it would seem that commerce and industry are getting quite a

fair share of boys leaving public schools. Industry, I find, is scarcely any longer looked upon as a "dirty alternative" to the Church, the Army, the Law and Medicine. Building claims just under one per cent. of those leaving public schools, but if within the sphere of building are included architecture and surveying the percentage rises to just over four per cent. Unfortunately, surveying covers a very wide field of activity and that part of it related to building work must be small. Consequently I imagine that building, architecture and surveying cannot be much higher than two and half per cent. Even when one takes into account the general nature of construction work, this is an incredibly small percentage for an industry which directly employs an eighth to a tenth of the nation's total working population.

Money isn't everything, but one of the weaknesses of the building industry in this context is the inability or unwillingness of those firms engaging this type of young man to set down in specific terms the rates of remuneration which the recruit might reasonably expect during the period of his training. However, the prospects for the building industry in getting a bigger share of public school leavers are not all black. Many young men leaving the public schools have developed a psychological "thing" about desk and office work. Building would seem to offer more than average chances of keeping this kind of training activity to a minimum.

Embarrassed Builders

ONE of the factors likely to embarrass building firms seeking to implement the new arrangements for refreshment breaks on building sites after October next is the way some larger firms, often carrying out civil engineering work, keep the job open for all the hours heaven sends—including all day Saturday and all day Sunday—so that the men can take home overtime-swollen pay packets.

In the provinces this creates a tremendous problem for building firms struggling to operate the jointly-agreed wages and conditions agreements of the industry. What operative is going to accept even the standard rate and a 20 per cent. bonus when he can go round the corner and get a job which, admittedly involving longer working hours, gives him a pay packet of two and even three times the size? What operative, even if he does stay with the local firm in those circumstances, is going to be willing to knuckle down to a sterner measure of site discipline, particularly with regard to the time he takes for his refreshment breaks?

When the wages settlement was reached earlier this year I heard a lot of murmurings among the bigger firms that nothing could be more calculated to put prices up and pave the way for another round of inflation. Of course, the settlement meant quite the reverse, but it is funny to see that those shouting about inflation in the first instance are the very people who are now contributing to it as fast as they can go.

There is an answer to this sort of thing and it is within the powers of Government departments, local authorities and nationalised boards who initiate the type of work to which I am referring to provide it. They should lay it down in the contracts they enter into with the contractors that there shall be no Saturday and Sunday working, under any circumstances whatsoever except those where safety considerations are likely to be involved. Why should taxpayers and ratepayers be made to pay through the nose, for that is what

they are doing, for work which might just as well be completed in 15 months instead of 12 months without any noticeable inconvenience being caused? This would stop much of the manpower cannibalism now going on and give local firms a better chance to apply the national agreements in the spirit as well as in the letter.

Those Subsidies

HOW is the Government progressing with its policy on home ownership? I refer you to a question put to Mr. Henry Brooke, the Minister of Housing and Local Government and Minister for Welsh Affairs, by Mr. Ian MacArthur, the Conservative member for Perth and East Perthshire. He wanted to know how many houses are now let by local authorities in England and Wales and what average rent is charged for them.

Mr. Brooke's reply was startling, to say the least. Housing authorities in England and Wales now own more than three and a quarter million houses for letting. According to the latest available figures the average rent for the year 1959/60, exclusive of rates, was just over 20s. a week. Of the 1,053 housing authorities in England and Wales making a return to "Housing Statistics, 1959/60", which is published by the Institute of Municipal Treasurers and Accountants, some 360 operate differential rent schemes of one kind or another, but of these only 96, or just over nine per cent. of the total number of housing authorities concerned, operate a rent rebate or differential rent scheme in which the maximum rent is fully unsubsidised.

In other words, not only are those not living in council houses subsidising an enormous number of those who do, but those who do live in council houses and are paying economic rents must be feeling pretty sick about all those similarly housed who are getting away with it by not paying an economic rent.

The more important issue, however, is that the Minister for some time past has been taking every opportunity he can to persuade housebuilders and developers to build more homes to rent. What kind of financial genius is likely to be forthcoming who can tell housebuilders how they can make this kind of development an economic proposition in the face of such competition from local authorities? I suppose that if time goes by and housebuilders fail in their attempts to overcome the problem there will be no shortage of critics who will blame the private enterprise side of the industry for not complying with the Minister's request. That is one of the reasons why I mention the matter now. The first thing the Ministry of Housing has got to do is winkle out from local authority houses all those whose needs and incomes are such that they cannot in any way be classed as desperate cases. This will make it easier for public housing to assume its role as a true public service. The influx of those able to afford and provide a home for themselves at economic rentals on to the general housing market would then quickly make it possible for housebuilders and developers to provide accommodation to rent. Simple, isn't it? Looks like the Minister and his department have got to get tough. There's still time to do so before the next General Election!

BOOKLET ON L.C.C. HOUSING

The story of the L.C.C. post-war housing effort is told in a new booklet entitled "Housing Londoners 1945-1960—The part played by the London County Council."

Available from the Information Bureau, County Hall, S.E.1, price 2s. 6d., the booklet sets out the salient features of the drive to provide more or better homes and adds up the product—111,976 homes built, 500,000 people housed, and 23,680 slums either completely cleared or being dealt with.

FIRST STAGE OF AYR BY-PASS BUILT IN 15 MONTHS

4.8 Miles of Dual 24ft. Carriageway

OPENING the first stage of the Ayr by-pass recently, Mr. John S. Maclay, Secretary of State for Scotland, described the scheme as an object lesson in co-operation and expedition.

It was, he said, less than 18 months since he authorised the start of work on the by-pass and it was just over 15 months since work began. In that short space of time, over 4½ miles of dual carriageway road, with three roundabouts and four bridges, had been completed and opened to traffic at a cost of about £½ million—all 4½ months inside the contract period.

What made it a still more remarkable performance, stated Mr. Maclay, was that a great deal of the work had been done in the late summer when the weather let the contractor down badly.

Route

After an investigation of several alternative alignments of a route for the by-pass of Prestwick and Ayr the final agreed line was made the subject of an order under the Trunk Roads Act, 1946, in February, 1959.

The by-pass, which is 4.8 miles long, is situated to the east of the two burghs and follows a route which commences at the Ayr-Mauchline road (A.758) about 400yd. east of Whitletts Cross and proceeds in a north-westerly direction joining the Turnberry-Ayr-Galston road (A.719) which it follows generally to Sandyford Smithy. From this point it turns gently towards the north-west, passing to the east of Shawhill Farm and crossing over the Monkton-Tarbolton road (B.739) at Brieryside Farm; it goes through Adamton Estate and to the east of the U.S.A.A.F. camp at Greensite to join the Kilmarnock-Ayr trunk road (A.77), about one mile north-east of Monkton Cross, and then proceeds in a westerly direction to join the Irvine-Monkton trunk road (A.78) near its junction with the Monkton-Troon road (B.749).

The road has been located to provide a

high standard of alignment and of visibility, the minimum radius of curves being 4,300ft. and the maximum gradient 1 in 37. The layout comprises dual carriageways each 24ft. wide, two verges 12ft. wide and a central reservation generally 15ft. wide but increasing in width to 30ft. at the junction with route A.719 at Sandyford Smithy to facilitate turning movements.

Three Roundabouts

Three new roundabouts, each with an island of 180ft. diameter and 30ft. wide perimeter carriageways, are provided at the junctions of routes A.758, A.77, and A.78 with the by-pass.

A total of six bridges have been constructed and these are located at Powburn; Adamton, carrying the by-pass over route B.739; Ladykirk Burn; near Whitletts carrying the by-pass over the Ayr-Annbank railway line; and farm access overpass bridges at Whiteside and Shawhill. A cattle underpass is also constructed north-west of the A.77 roundabout.

Before works were commenced, and during the course of the contract, surveys were carried out to obtain information on the nature and bearing capacities of the soils. One of the results of this investigation was a decision to provide a system of vertical sand drains in the minor valley of the Dow's Burn where very soft, weak and highly compressible soil was revealed.

In all 550 vertical drains were sunk at about 7ft. 6in. intervals. The function of these drains is to provide an efficient drainage system to allow rapid dissipation of water in the soft compressible soil. By those means the embankment formed in this area was stabilised in a relatively short period and it is hoped that movement of the embankment which otherwise might have occurred over a period of years will be avoided.

The construction of the new road involved the excavation, placing and compaction of approximately 509,000 cu. yd.

of material, roughly half of which had to be imported to the site. The carriageway construction varies in depth along the road depending upon the bearing value of the sub-soil, the minimum thickness being 19in. and the maximum about 24in.

Dry-Lean Base

The crust of the carriageway is comprised of 8in. thick dry-lean concrete as a base, 2½in. thick bituminous macadam base course and a wearing surface of 1½in. thick asphalt.

The bridges at Powburn (39ft. span), Ladykirk Burn (29ft. span) and the railway bridge (28ft. span) near Whitletts have mass concrete sub-structures and filler joist decks—at Adamton the 55ft. span bridge over route B.739 has a mass concrete sub-structure while the deck is of composite construction comprising universal steel beams and reinforced concrete.

Farm access overpasses have reinforced concrete sub-structures with a filler joist deck continuous over the four spans. Numerous culverts of various sizes have also been constructed.

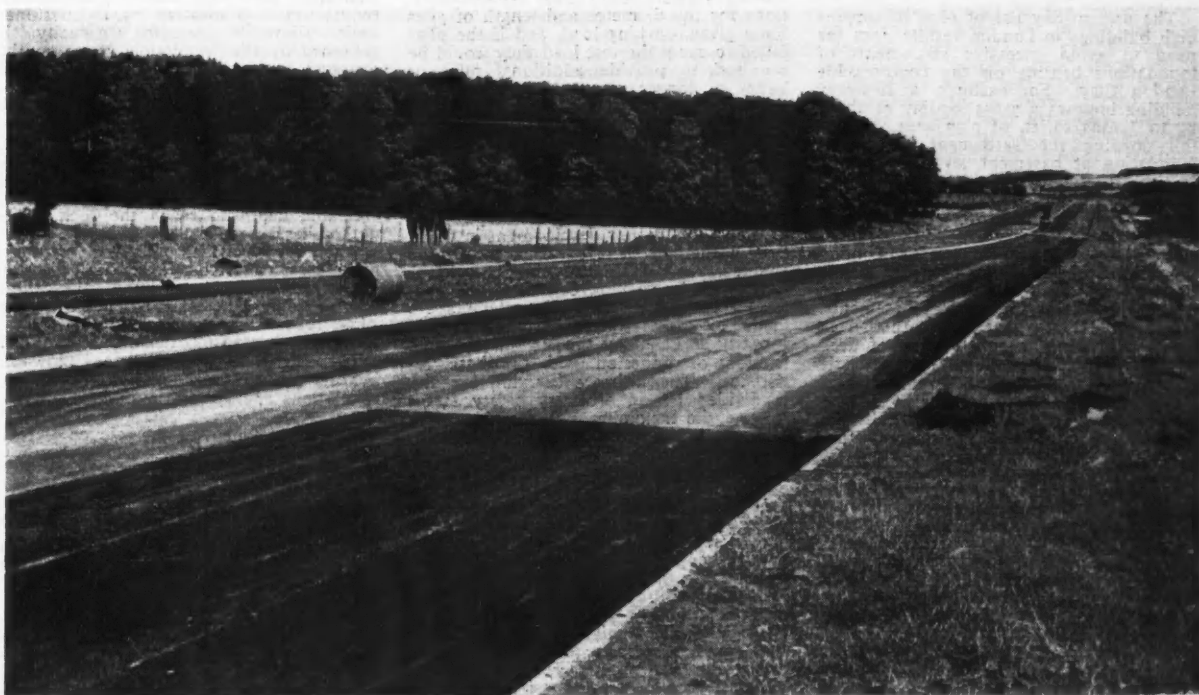
The route for traffic to Ayr via the by-pass involves going along Whitletts Road and Ayr Burgh Council carried out a length of dual carriageway work on this road south of the roundabout at the A.758 junction. Victoria Bridge on route B.747, which will take an additional volume of traffic on the completion of the by-pass, was also strengthened.

It is the intention to plant, in the interests of amenity, bushes and trees on the slopes of cuttings and embankments and also on the central islands of the roundabouts as special features.

Contractors

The scheme was prepared and the construction supervised by Ayr County Council (County Surveyor, Mr. D. Torrance, M.I.Mun.E.) as agents for the Secretary of State.

Whatlings, Ltd., Glasgow, were the main contractors.



Completed surface of the road between Kilmarnock Road and Irvine Road

SYMPOSIUM ON LARGE DIAMETER BORED PILES

Six Papers Presented at London Meeting

FUNCTIONS AND PRINCIPLES OF DESIGN

By M. J. Tomlinson

IT is first desirable to define what is meant by a large diameter bored pile. Driven or bored and cast in-situ piles in various proprietary forms are commonly installed in diameters of up to 26in. for working loads of up to 130 tons per pile. Piles of such types are not generally recognised as coming within the class of "large diameter" piles. The author therefore suggests that all piles of 30in. diameter or over should be classed as large diameter piles. The term "bored pile" should be applied to deep foundations of any diameter which are formed by drilling from the surface by grab, auger or percussion-type rigs. Where deep excavations for foundations are sunk by hand methods in pits lined by timbering, precast concrete sections, or metal segmental or cylindrical units, the author suggests that these should be called "deep shaft foundations." The term "deep cylinder foundations" can be used to described all types of deep circular foundations whether sunk by boring methods, by hand excavation in lined pits, or as caissons.

Over the last 10 years the use of large diameter bored piles in Britain has increased to a considerable extent, particularly over the last two or three years. This is due to two main reasons: first, to the present-day tendency to build high, with consequent increase in column loads of framed structures; and, second, to the development of efficient mechanical rigs for boring large diameter holes to depths of up to 200ft. There is nothing new in large diameter deep foundations. They were used in Chicago and New York nearly 70 years ago to take the foundations of skyscrapers down through deep deposits of sands and clays to rock. The only difference is that these earlier deep foundations employed mainly hand methods of excavation within concrete or steel caissons or in timbered shafts. The well-known "Chicago method" developed by William Sooy Smith (1830-1916) uses vertical timber sheeting supported by circular steel walings.

The present-day use of piles to support high buildings in London results from the need to avoid excessive settlements of foundations bearing on the compressible London Clay. For example, a 20-storey building imposes a gross loading of about 2½ to 3 tons/sq. ft. of plan area. Under this loading the settlement of a raft foundation at basement level might well amount to 9in. or more, and the corresponding differential settlements would be intolerable to normal structures. It therefore becomes necessary to take the foundations down to less compressible London Clay at depths of 60ft. or more below ground level, or alternatively to reduce the net loading on the soil by deep basements, or a combination of the two methods. In Central London the construction of deep basements may be difficult and costly because of the need to underpin adjacent buildings and other complications such as the presence of underground railways. Their construction is time-consuming, thus delaying the commencement of the revenue-earning life of the building, and in any case deep basements may be of no economic value to the building owner. In most cases, therefore, the usual practice is to adopt deep piled foundations with shallow basements or no basements at all.

Buildings of 20-storey height are likely to have column loads of up to 1,000 tons. If ordinary piles are used, say 20in.-22in. diameter piles of 90 tons nominal maximum capacity, a pile group about 15ft. square will be required with a correspondingly heavy pile cap. Also, with columns at normal spacing it is likely that such large groups will be nearly touching each

other and it becomes necessary to combine the pile groups into a large and heavy raft. The alternative of providing one single large pile beneath a column is therefore attractive. However there are a number of complexities involved in the design and construction of large diameter piles which are discussed below.

The introduction of large diameter bored piles has greatly stimulated the calculation of carrying capacity by "static" or soil mechanics methods. Previously specialist contractors installing proprietary types of

cedure of dividing the ultimate carrying capacity of all piles in a structure by the same arbitrary safety factor is open to doubt. In almost all cases of large diameter bored piles on compressible soils, whether these are clays, sands or gravels, the allowable working load is governed by considerations of the permissible total and differential settlements of the structure. Therefore, if the columns of a building carry widely varying loads, it may be necessary to vary the safety factor for each pile or pile group in order to prevent excessive differential settlement. It is the normal practice to determine allowable bearing pressures on heavily loaded strip, pad or raft foundations from a settlement analysis, and the maximum safe bearing capacity for such foundations, as calculated from the ultimate bearing capacity divided by an arbitrary safety factor, is only used as a preliminary guide to the selection of bearing pressures in the settlement analysis.

Carrying Capacity

For the reasons stated above the author suggests that the same procedure should be used for large diameter bored piles as is used for shallow foundations, i.e., allowable settlement both of individual piles or pile groups and of the whole structure should be the criterion of design rather than ultimate carrying capacity of the individual piles. Unfortunately the settlement analysis of deep foundations, which derive their carrying capacity partly from skin friction and partly from end-bearing, is far from straightforward, and the mechanics of load sharing between these two components is not fully understood. This is particularly true where enlarged bases are adopted.

It is gratifying to note that the Institution of Civil Engineers is to conduct a research programme to study the load settlement characteristics of deep bored cylinders. The results of this work should be of outstanding significance, and should do much to resolve the present uncertainties in making settlement analyses for foundations of this type.

Where large diameter bored piles are bearing on hard rock such as granite, hard sandstones and massive hard limestones their allowable carrying capacity is governed by the permissible stress on the concrete in the pile shaft. However, in the case of piles in soft rocks such as marl, chalk, shale and weak sandstone there is no satisfactory basis for design. The use of arbitrary figures of bearing capacity given in handbooks or Codes of Practice is likely to be uneconomical in cases where piles have to be taken down to a considerable depth to reach the rock. The author has heard of a case where a higher working load has been permitted for ordinary precast concrete piles driven to refusal in rock than for large bored piles three or four times their size founded on the same rock. In the first case a dynamic formula was used to calculate the working load, in the second case the allowable bearing pressure was taken from building regulations appropriate to shallow foundations.

The development of the science of rock mechanics is needed to enable allowable bearing pressures to be calculated on a realistic basis.

Effect of Constructional Procedure

Skempton¹ has shown that the ultimate adhesion of bored piles in London Clay varies from 0.3 to 0.6 of the shear strength of the clay with an upper limit of 2,000lb./sq. ft. He suggests that the adhesion factor is, *inter alia*, related to constructional methods: the lower factors being the result of softening of the clay due to exposure when a long time is taken to install the pile, to seepage of water down the pile shaft, or to the absorption by the soil of

A Symposium on Large diameter Bored Piles, arranged by the Reinforced Concrete Association, was held at the Royal Aeronautical Society, London, last week. The authors of the six Papers presented were: M. J. Tomlinson, M.I.C.E., A.M.I.Struct.E., chief engineer, Central Laboratory, George Wimpey and Co., Ltd.; D. J. Palmer, senior civil engineer, Peter Lind and Co., Ltd.; M. W. Leonard, B.Sc.(Eng.), M.I.C.E.; Peter Dunican, M.I.Struct.E., partner, Ove Arup and Partners; W. G. K. Fleming, B.Sc., Ph.D., technical adviser, McKinney Foundations, Ltd.; and J. A. Derrington, B.Sc.(Eng.), M.I.C.E., A.M.I.Struct.E., civil engineer, Sir Robert McAlpine and Sons, Ltd. A report on the discussion following the presentation of the Papers will be given in our next issue.

bored and cast-in-place piles relied on "rule of thumb" or past experience based on test loadings to assess the working loads. It was the usual practice for such contractors to tender on the basis of putting forward their own recommendations for the diameter and length of piles for a given working load, and if the piles failed to carry the test load they would be required to provide additional piles or larger or longer piles. Needless to say, the recognised specialist contractors are jealous of their reputation to provide piles of adequate capacity and cases of failure under test load do not often occur: collapse of structures owing to the failure of piled foundations is very rare indeed.

Because large diameter bored piles are a comparatively new development in Great Britain there is little experience to guide engineers and contractors in the calculation of their carrying capacity and long-term settlement. Generally attempts are made to assess their ultimate carrying capacity as given by the sum of the skin friction or adhesion and the base resistance. The ultimate carrying capacity is divided by an arbitrary safety factor to give the maximum safe carrying capacity of the individual pile. Since it is usual to adopt a safety factor of 2½ or more the calculated ultimate carrying capacity may be of the order of several thousand tons which makes test loading to check the validity of the calculations a highly expensive procedure; so much so that the engineer may decide to limit the test loading to say 50 per cent. above the working load, applying the test to one of the permanent piles. Thus there has been little opportunity, up to the present time, for engineers to prove to their own satisfaction that the current methods of calculation of carrying capacity by "static" methods are basically sound.

In the author's opinion the normal pro-

excess water in the concrete. In the case of long straight-sided piles in clay a high proportion of the load is carried in adhesion, and therefore the selection of the correct adhesion factor is a matter of utmost economic importance. Deep and large diameter bored piles inevitably take longer to drill and concrete than ordinary piles, and it is quite wrong to assume that delays will not occur from time to time. Where the piles are mechanically under-reamed it is by no means unusual for the under-reaming tool to break off down the hole on striking claystones. Enlarged bases made by hand excavation may take four or five days to complete in the very large diameters, and in fissured clays there is a risk of collapse of the enlarged hole. These contingencies should be allowed for in the design by assessing the adhesion factor in the lower range of values. Very low values of shaft adhesion will also affect the analysis of settlements since they will tend to throw increasing load on the base of the piles. Delays in constructing the piles may also lower the end resistance if water is allowed to collect in the base, or if the clay in the base becomes puddled and softened by operations to recover a broken tool or clear collapsed debris.

The occasional small diameter pile "going wrong" has no serious consequences. It is a comparatively simple matter to put an extra pile on either side of the defective pile with a comparatively small enlargement of the pile cap. Where, however, heavily loaded columns are carried by single piles it may be impossible, for structural reasons, to do this. Each large diameter bored pile is an important foundation structure in its own right, and the utmost care and conscientiousness is required in construction.

SOME CONSIDERATIONS AFFECTING DESIGN

By D. J. Palmer

THE use of rapid drilling methods to construct large diameter cylinder foundations is a comparatively recent development in this country, and a variety of approaches are made to design. Broadly speaking the methods used are an extension of those used for bored piling of conventional size but modifications are necessary, particularly in the special case of cylinders with expanded bases (belled cylinders). With the reduction in the number of units over conventional piling, the failure of a single unit is a much more serious matter, and therefore the design may be said to be all the more critical.

Much of the following will be concerned with large diameter cylinders in London Clay because a substantial part of the work is carried out in the London area. The London Clay is particularly suitable for the rapid drilling systems in use and its properties are well understood. Moreover it would seem to present a special problem in founding belled bases, which does not occur with harder and more unyielding strata.

There are two main requirements in design, common to all piling:

- that there is an adequate factor of safety with regard to overall shear failure; and
- that the loads are so transferred to the ground that the deflections of the foundations are within the limits that can be tolerated by the structure.

Bearing Capacity

First consider the safety of the foundation with regard to catastrophic failure. It is widely accepted that the ultimate bearing capacity of plain cylinder foundations in clay is given by:

$$Q_u = Q_p + Q_s = 9c_p A_p + c_s A_s$$

where Q_p = point bearing capacity

Q_s = skin friction

c_p = shear strength at the base of the cylinder

A_p = area of the base

c_s = average adhesion between clay and shaft

A_s = area of shaft in clay

The application of this method to London Clay is discussed very fully by Skempton¹ where it is shown that the adhesion may vary between 0.3 and 0.6 of the shear strength, c , but most commonly may be taken as 0.45c. It is possible that the improved techniques in large diameter drilling may allow an increase in this factor, but this requires substantiation. Skempton recommends that generally a factor of safety of not less than 2½ should be applied to the ultimate bearing capacity calculated in this way to give the allowable load, and for the particular case of large diameter cylinders suggests that the factor of safety should be more, in order to restrict the settlements.

The following points should be noted with regard to this method of calculating the allowable load on large diameter cylinders:

- The factors used $N_c=9$ and $a=0.45$ are based on standard techniques of 4in. dia. sampling in conformity with CP 2001.² Such sampling seems to give tolerably consistent trends in shear strength down to depth of about 60ft. but seems to lead to very erratic results at greater depths.³ In the event of sampling techniques improving, the factors may have to be altered;
- The shear strength as given in Skempton's average relation between shear strength and depth would appear to be too high. Records from a large number of sites suggest that the average shear strength at depth should be some 25 per cent. lower. It may be argued that this is because of the indifference of the sampling methods employed, but nevertheless this is the reality with which the designer is faced;
- Where London Clay extends from ground level downwards adhesion should be discounted for at least 10ft. because of seasonal shrinkage and swelling;
- Where London Clay is covered by an overburden, including Thames gravel, great caution is needed before allowing any frictional support from the overburden, as this may be affected by the drilling operations;
- The factor of safety on the ultimate for a plain cylinder need not necessarily be greater than 2½, since single large diameter cylinders may not settle appreciably more than the groups of piles they replace;
- A thorough site investigation is necessary. In this respect quantity is no substitute for quality. All too frequently irrelevant information is included in many soil mechanics reports. It is difficult to justify mechanical analyses of Thames Gravel when information on the shear strength of the clay is sparse. An adequate number of boreholes is required. Deep depressions in the London Clay are not all that uncommon. Economic design is dependent on adequate expenditure. A hundred pounds spent on shear tests may save ten times or more in the cost of the foundations.

The application of the above methods in London Clay has attained a great deal of reliability with their wide use on bored piles of conventional size, and latterly in connection with deep large diameter plain cylinder. Their use for belled cylinders is the subject of some speculation.

The method is in wide use in the United States, where there is a vast amount of experience in the use of belled foundations dating from the days when they were hand dug. But in Chicago and New York the ground conditions are very different from those in London, and the belled foundation over there is usually designed as an end-bearing foundation founded on rock or other relatively unyielding material. The London Clay by contrast is a relatively compressible material with shear strength increasing, and compressibility decreasing, with depth. The published data on the behaviour of belled foundations in London clay is sparse, and such as there is would seem to justify some caution, together with the retention of an open mind.

One authority (Kirkland, 1960)⁴ has maintained that the bell inhibits the skin

friction on the shaft. On the other hand model tests by the Building Research Station have suggested that the shaft friction is almost fully effective, but also suggest that a larger movement is required to mobilise the end-bearing resistance than to mobilise the shaft friction. This is also confirmed by Skempton, and by Fleming and Frischmann (1960).⁵ The latter view would seem more in accordance with the known facts, but it is thought probable that there is some lack of adhesion on the shaft in the immediate vicinity of the bell.

If this view is correct then there would seem to be some justification for applying one factor of safety to the ultimate skin friction and another to ultimate end-bearing (as calculated by the methods outlined above) in order to restrict settlement. Assuming for the moment that $F_s=2$ for skin friction and $F_e=4$ for end-bearing, it can be shown that applying an overall factor of safety of 3 to the ultimate load could lead to an over-estimate of allowable load, i.e., the load at which settlement is kept within tolerable limits. (It should be stated that the values of factors of safety are for example only, and no claim is made for their validity.)

One method of calculating the bearing capacity of belled cylinders deserves mention. Developing out of the thesis that the bell inhibits shaft friction, it is proposed that the foundation should be considered as purely end-bearing, and that the ultimate end-bearing should be calculated in the conventional way and divided by a suitable factor of safety. One such method for London Clay proposes that the allowable bearing pressure should be taken as $3 \times$ shear strength at the level of the bell, with a limit of 5 tons/sq. ft. The method would appear to be unduly conservative at depths greater than about 40ft. It might prove dangerous where the shaft is relatively short because the development of the ultimate shaft friction might indeed be the saving grace of many belled foundations already constructed.

Yet another method proposes that, assuming the shaft friction to be effective, the shaft shall be made long enough so that the working load is equal to the ultimate skin friction, the bell providing the factor of safety. The method seems safe enough, but is likely to lead to excessive lengths of cylinders.

The study of the bearing capacity of large diameter cylinders in London Clay serves as an aid to determining the bearing capacity in other formations. However, design must depend on the reliability of the methods used for measuring the significant properties of the formation. For example "boulder clay" starts off as a geologist's term and covers a variety of materials ranging from clay to dense granular material with little clay. Keuper Marl again is a broad classification, and varieties are commonly found ranging from the consistency of firm clay to fairly hard rock. Shear strength measurements of Keuper Marl are commonly misleading.

Much depends on the individual engineer's experience and often loading tests are the only practical answer. Belled foundations resting on rock are a satisfactory foundation, but ignorance often leads to the choice of a very conservative loading of the rock. In particular chalk might be mentioned, where experience suggests that the figures given in CE Code of Practice No. 4⁶ are unduly conservative. But again it is very important to be able to measure the hardness of the chalk by some suitable and practicable test. The author's experience is that the relative hardness of soft rocks such as Keuper Marl and chalk can be assessed by means of the standard penetration test.

Settlement

The problem of settlement has already been brought into the discussion on bearing capacity because it is, of course, inseparable from the definition of "allowable bearing pressure" (see CECF No. 4, p. 179). The problem is complicated chiefly because it is rare for the settlements of completed structures to be measured. It would appear that some current practice

is still in line with Mr. H. J. B. Harding's observation that the reference bench mark is transferred to the foundations as soon as they are in. There is then no settlement and no problem. Skempton and MacDonald⁷ suggest that for isolated foundations the total settlement allowable for clays may be of the order of 2½ in., and the maximum differential settlement allowable of the order of 1½ in. provided that the angular distortion is not greater than 1/500.

The settlement to which the foundation is subject should be considered in two parts: (a) the immediate settlement which takes place on application of load; and (b) the consolidation settlement which, in clays, continues long after the application of load. It is important to note that the total settlement of the foundation is not directly related to its settlement in a loading test. The effects of time and of neighbouring foundations in a group must be considered.

The differential settlement of adjacent foundations depends chiefly on the loads carried and on time, and "it is really necessary to state the working life of a building in order to design the foundation" (Golder, 1956).⁸ The total settlements can be quite large if they are all of the same order, but it must be ensured that the differential settlements are within tolerable limits. For equal load intensity the total settlement will vary as the width of the foundations, but not directly. For example the case of adjacent loads of 150 tons and 1,500 tons each supported on one belled foundation at, say, 40 ft. below ground level on London Clay may be considered. Such a juxtaposition is by no means uncommon. Making the usual corrections to the settlement calculations (Skempton, Peck and MacDonald, 1955)⁹ the immediate differential settlement might typically be of the order ¾ in., and the gross long-term differential settlement, 1½ in. This is just about as much differential settlement as could be considered tolerable, and must be viewed in relation to the column spacing. In many structures the angular distortion would be a good deal more than 1/500 and damage to the structure might well occur. A careful examination of such cases is therefore necessary.

It is seen that for any particular project it is important that the structural designers should specify the differential settlement that can be tolerated. The settlements of the foundations during the working life of the building should be estimated to ensure that they are tolerable. All too often the foundation designer is asked to do his job without possession of the relevant facts.

Concrete Stresses

One allied problem that should be mentioned is that of permissible concrete stresses. According to CP 114¹⁰ direct compressive stresses of 760 p.s.i. and 950 p.s.i. are permissible for 1:2:4 and 1:1½:3 concretes, respectively. According to CECF No. 46 the compressive stress should not exceed 750 p.s.i., by implication, whatever the class of concrete. There does seem to be some conflict here, and CP 114¹⁰ would seem to be the more rational.

There are some grounds for supposing that a belled base may fail by punching shear on occasion, and this aspect should be carefully examined.

Conclusion

With these problems in mind the Institution of Civil Engineers has taken the initiative of forming a committee on Deep Bored Cylinder Foundations composed of representatives from the Institution's Piling Committee, from the Association of Consulting Engineers, and from a number of the contractors engaged on this type of work. The main objects of the research proposed are to investigate the bearing capacity and settlement characteristics of plain and belled cylinders by means of loading tests, and to measure the settlement of structures supported on large diameter foundations. It is hoped that as many organisations as possible will give any information they may have to the Committee.

Much of the foregoing deals with the

special problems of large diameter cylinders in London Clay. This is inevitable since much of the work is carried out in this formation and its superficial properties are in general better established and less complicated than with other formations. However, it is thought that the study in London Clay will lead to a better understanding of the problems in general. In particular, whilst drawing attention to possible problems relating to belled cylinders, it is not desired to depreciate their value, but rather to state what is known and not known as an essential preliminary to their general acceptance.

SOME PRACTICAL ASPECTS OF CONSTRUCTION

By M. W. Leonard

THE choice of method of construction of large diameter bored piles is usually dependent on the soil profile in which they are to be founded and should therefore only be made after the contractor has had an opportunity to study the soil and ground water conditions. A site investigation report should, of course, be obtained for other important reasons, including the designing of the foundations, the comparison of ways of using bored piles, or alternatives such as conventional driven piles, the effects of piling on the proximity to adjacent structures and so forth.

Before the most suitable method of foundation construction is selected the load settlement characteristics of such piles must be established, as these affect the diameter and length of piles to be formed; also the reliable carrying capacity of the piles singly or in groups must be worked out to see that they are suitably centred. Again the soil profile will influence the longitudinal section of the pile. For example, if there is a big change in strata such as soft material overlying rock, when the latter is the significant load-carrying element, then a smaller shaft with an enlarged base may be preferred, or alternatively, in certain cohesive soils, where shear strength gradually increases with depth, a simpler section with a plain shaft may be preferable. All such points therefore have to be considered before the method of construction can be decided.

At present the choice of the method of construction of these piles is rather a matter of opinion. As the specialist contractors use different kinds of plant, there is naturally a tendency for preferential declarations to be made which do not necessarily mean that they are right or wrong, but simply that the good contractor is asserting his privilege of basing his offer upon the use of his plant at the best possible terms. Of course, if these should be specious then he will eventually be buried by his claims, and regrettably may well create a doubt in the minds of architects and consulting engineers that these large diameter piles are not all that they should be. It is not being too dogmatic to say that each site requires its own prognosis for the foundation and the method of construction is only one of many considerations. In examining any problems it must be borne in mind that there are many contributory factors other than that of the construction which are concerned with the correct economic engineering solution. It is the author's opinion that this type of pile and its mechanism of behaviour (since it is relatively new to this country), need much further consideration before there can be any definite method of design, and that therefore, for the time being, those who wish to employ these piles have to rely to a considerable degree on the specialist contractors who construct them.

These piles are formed from ground level by boring a suitable sized hole to a required depth by mechanical means, and the subsequent hole is then backfilled with concrete. (The principles mentioned in this paper often apply to the full range of diameters of cast in-situ bored piles.)

Broadly speaking, there are two principle methods of constructing large diameter

bored piles or cylinders, as they are often termed to distinguish them from the conventional bored pile of up to 2 ft. diameter; the first, where the ground is sufficiently stable to be bored to form a hole that does not need any artificial support to its sides; and the second, where the borehole would collapse if no means were used to protect the walls from falling in whilst the hole is being sunk—usually by excavating with a grab. The former case, which is comparatively simple, requires equipment capable of boring to the required depth as economically as possible. In the latter case, however, the means to restrain the walls from collapse are an added cost and call for special techniques which depend on the circumstances.

Cased Boring

While there are several means of preventing collapse of the walls of these bored piles, the one usually used in this country is to line the boring with a casing. This is usually a steel liner whose length can be varied by special joints connecting the tubes; alternatively the length can be increased by welding each length to another, but the welding must be done carefully to avoid a dog-leg in the casing. The special joints which make a temporary connection of one tube with another will vary from manufacturer to manufacturer; one of the best proven to date is in the form of a spigot-and-socket flush joint with special bolts which do not project beyond the wall of the casing.

Such casings can be sunk by hammering them into the ground, a method usually employed for shallow piles, or (more often) by rotating the tubes as the soil is excavated from within by a grab or other excavating device, in order to avoid a build-up of skin friction on the tubes. The method of rotating the tube that is commonly used is to apply a torque by means of a lever arm, one end of which is in the form of a clamp which grips the casing, and the other fixed to a reciprocating mechanism which provides the necessary force. In another case the lengths of the arms of the lever are themselves variable by their containing hydraulic rams. The general method of turning a big casing in order to get it into the ground is not new, and the organisation with which the author is associated used such methods some 30 years ago, but to-day there has been a big improvement by turning the tubes in a reciprocating manner, just a few degrees, using hydraulic power.

It is important to keep the tubes on the move during the boring operations and they should not be allowed to be at a standstill longer than is necessary, although this will depend on the soils surrounding the casing. The extraction of the casing is achieved by applying a similar torque to that necessary to sink the hole, but in addition some uplift is required which is usually given by hydraulic rams. There is a danger of trapping the casing in the ground and as the casing is very expensive—replacement being as much as £50 per foot, depending on diameter—it is most important to see that the method of construction takes this fact into consideration.

The forces to turn these casings are sometimes enormous and it is desirable to have sufficient reserve of power, and to ensure that the equipment is adequately designed and suitable for the purpose. Such equipment is very expensive but this is readily understood to anyone seeing the machines in use.

Uncased Boring

The simpler case, when no such lining or precaution against wall collapse is necessary, generally applies when drilling through cohesive soils; but sometimes when such soils are overlain by a small depth of gravel, it is necessary to place a temporary lining through the gravels, particularly when they contain water which is not sealed off and will go down the boring and soften the clay.

The machine-powered auger which is commonly used is generally turned by means of a kelly bar which is in one length if the holes are shallow; a telescopic type

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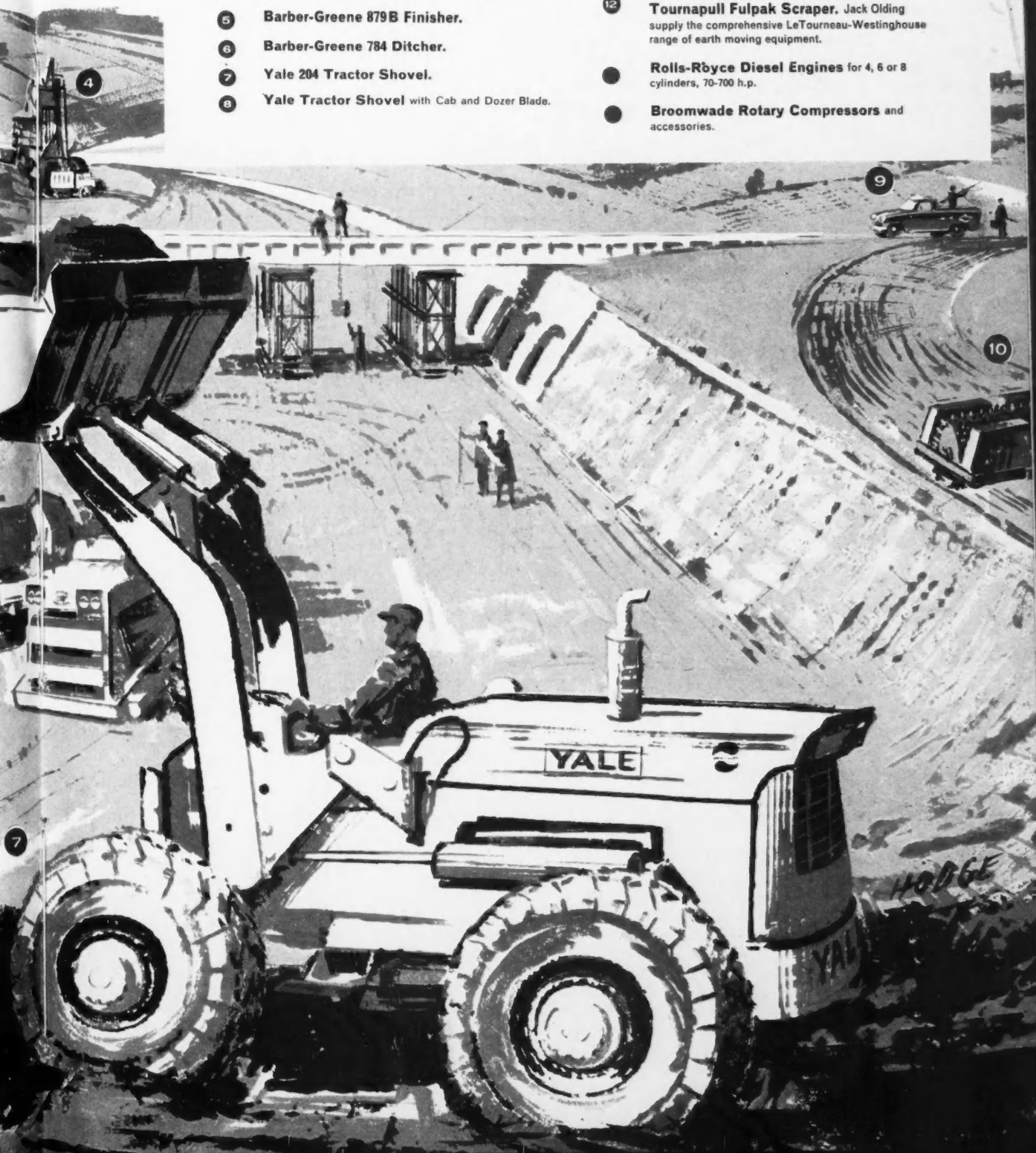
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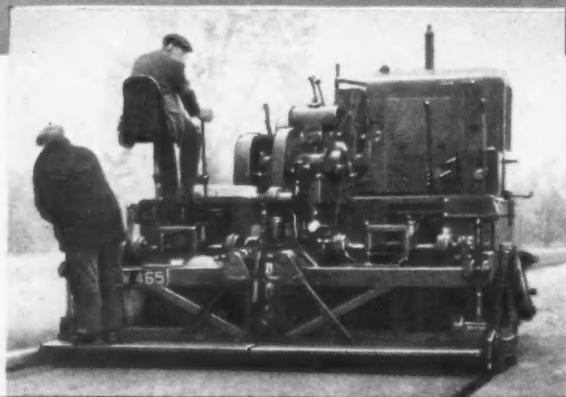
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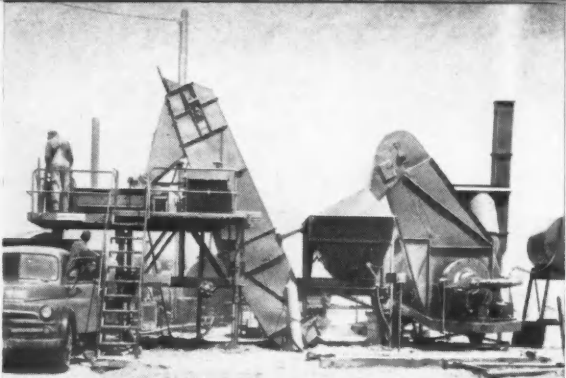
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can be used to a depth of 100ft.-150ft. Such a kelly gives flexibility to the boring machine and provides the necessary torque at depth to turn the auger in cohesive soils of varying shear strengths. There are two main types of auger; firstly, the bucket type which retains its cutting within the bucket which is then brought to the surface for discharge into a dumping vehicle, and secondly the helical auger which retains its cuttings on the helix faces, these being discharged on to the ground when the auger is extracted.

There are various adaptations to the boring device to enable the diameter of the shaft to be reamed out following the initial boring and an enlargement can be formed at the base of the pile by means of special tools. Tougher soils and soft rocks can be bored by various drilling devices such as rock roller bits, tines, and hardened faces to the augers.

This method of construction is fast through suitable soils, but difficulties are to be expected when ground water is met which makes collection of the cuttings difficult, particularly when the soils are slurred up by the rotating tool; when an enlarged base is required, problems can arise because claystones and other obstructions harder than the surrounding soil must be penetrated.

Enlargements to the foot of the cylinders can also be achieved by hand excavation, care being taken to protect the workman from soil collapse; it is also necessary to ensure that exhaust fumes are extracted from any pneumatic tools in use, and also any poisonous gases such as marsh gas which are encountered.

Reinforcement and Concreting

Reinforcement cages are made up to be lowered into the hole and when enlarged bases are specified this sometimes requires special attention to facilitate fixing at the base of the pile. Reinforcement does not necessarily have to extend to the full depth of the pile. Concreting is carried out by several methods and concrete is usually brought to the pilehead by conventional means. Sometimes the borehole is filled with selected gravel for subsequent pressure grouting. Occasionally this method is used in cased holes as it enables the costly casing to be extracted before grouting; this avoids the trapping of the lining which sometimes occurs when normal concrete is used and the casing is difficult to extract. However, care must be taken when using this method of piling through fine-grained soils since these may flow into the heart of the pile when the casing is removed.

Concrete can be placed by shooting it down trunking, using bottom opening skips, or simply dropping the concrete in small quantities to minimise segregation; a tremie is also an accepted practice in certain circumstances. In the author's opinion it is important to get the concrete down the hole so that it flows against the walls of the pile; rigid insistence on dry mixes and high concrete strengths is inconsistent with good practice for cast in-situ piles. The concrete must have sufficient workability to ensure proper placing.

Generally the operation of forming the cylinders should be carried out in a continuous manner, with a commonsense interpretation that there can be a lull between boring and concreting consistent with the soil and working conditions. To insist on working through the clock to achieve continuity does not take into account the possible drop in standards of workmanship to which men may be subject when engaged over long hours in relative darkness; this, of course, is a matter of supervision.

Conclusion

The most important thing to appreciate is that no matter how eminent the contractor, how excellent his brochures, there is no substitute for good supervision of the operations from start to finish, and that the equipment operators themselves make a very significant contribution to the success of the construction of any type of bored cast in-situ piles.

The construction of this type of founda-

tion calls for specialist knowledge, and although each system has its merits or otherwise, the use of this type of piled foundation for major projects will only continue if those who use them agree on their application on a sensible good civil engineering basis; bearing in mind that the significant part of the construction takes place out of sight, it is most important that the advantages of this type of foundation construction are not taken for granted, particularly by those to whom it is a relative novelty.

It is not possible to cover all the specialist firms' techniques and, in fact, it may be regarded as an impertinence for any one person to attempt to do so, because there is much in a technique which is known only to those who practise it. However, the author hopes that the broad opinions outlined in this contribution will assist those on whom the onus lies to decide whether to employ large diameter cylinders as part of their foundations. Like any other construction method, they have to be used in the proper place, and it is to be hoped that there will be no abuse of them either in design or construction, as undoubtedly they constitute a significant contribution to the civil engineering profession and contracting to-day and will continue to do so.

USE OF LARGE DIAMETER BORED CONCRETE PILES

By Peter Dunican

THESE notes are intended to summarise and comment on the experience of the author's firm in the use of these piles in the London area since 1959.

It is not known exactly how these piles work and although there has been much conjecture regarding their theoretical performance and the so-called mechanism of failure, there is little quantitative knowledge of their behaviour under working load conditions. Undoubtedly much test data exist but they are not yet readily available in any useful form. However, within these limits some kind of economic pattern is emerging which, together with information on performance and application, is of significance to the consulting engineer.

Economics

Initially, approximate cost analysis based on rates provided by specialist contractors showed that the cost per ton of load carried by large diameter bored piles—whether under-reamed or not—was competitive with the cost of conventional piling. Therefore, in suitable cases, competitive tenders were obtained for the different types of piled foundations commercially available. The buildings in each case were not the same although they were all tall tower-like blocks on London Clay overlain by other deposits of varying thickness.

In one case it was found that 3ft. diameter straight cylinders, 85ft. long and each carrying 250 tons, provided a marginally cheaper solution than small piles. There was an additional saving in the pile caps with the larger piles, because single instead of double rows of piles could be used. In this instance under-reamed piles were not competitive, but this was felt to be due to a certain lack of interest in the job.

In another case, and coincidentally to support what was in principle an identical structure, large under-reamed piles carrying a maximum of 265 tons were more than 10 per cent. cheaper than small piles, and they will probably provide a saving of another 10 per cent. of the pile cost due to economies in the caps. Large straight cylinders were in this case among the small piles in price although 10 per cent. more than the lowest small pile tender. Here the ground conditions were such that a much longer shaft was required for the straight cylinders to compensate for the under-reaming in the lowest tender. The conclusions from this job were borne out by a third, in which under-reamed piles were 10 per cent. cheaper than small piles. In each of these cases the safe load-carrying

capacity had to be agreed with the local authority.

However, lack of data or understanding of the behaviour of under-reamed piles has occasionally distorted the pattern. For instance, the foundations for a 17-storey office block were considered which would carry column loads of up to 690 tons, to be built on some 27ft. of sand overlying London Clay. A careful preliminary estimate, which included a special pile cap design for each pile type, indicated that under-reamed piles should show a saving of about 10 per cent. on small piles, a large part of the saving being in the pile caps. Tender figures confirmed this estimate but the local authority required a load test to confirm the design of the under-reamed piles and as the test would have cost so much time and money small piles became more economical.

Another factor affecting cost would appear to be the presence of a high water table on the site, no doubt due to the particular problems this creates in carrying out the boring and concreting.

Performance

Some concern about the possibility of segregation of the concrete in deep large diameter cylinders has been expressed. The author's firm had the opportunity to inspect some 3ft. diameter piles on two sites, and their appearance was most encouraging to say the least. In one case, where 50ft. long piles were used to form a retaining wall, the top 30ft. was exposed later during the construction of a new basement. The concrete was found to be of uniformly good quality. It was a "design mix" concrete giving 2,800 p.s.i. at seven days, with a 3in. slump, and it was dumped in place half a cubic yard at a time. A small proportion was piped down, but it all looked the same. The concrete was vibrated.

On another job with similar piles some sample cores were drilled out of two of them to a considerable depth, and the condition of the concrete could be judged not only by the recovery, but also visually, with the aid of a periscopic device.

In both cases, the visual examination of the recovery and the surface of the drill hole was satisfactory in that the concrete as placed appeared to be comparable with that which would be expected from a similar mix placed under normal conditions.

Although short-term test-loading records for cylinder piles are becoming available, there are insufficient data on their behaviour in practice under normal working load. Records kept by the author's firm on one particular building, where 3ft. piles with 7ft. bells going 37ft. into London Clay are used to carry about 226 tons (excluding wind loading), show that the immediate settlement under the full weight of the building is just below the range predicted (in fact about $\frac{1}{2}$ in.). The load is, in fact, about 25-35 per cent. above that permitted by the L.C.C. District Surveyor's interim rules. It was assumed in the settlement calculations that all the permanent load is taken on end-bearing, which is probably a little conservative for the early-loading period.

Application

There are many instances where large cylinder piles give the cheapest solution to a foundation problem, but obviously not the only feasible solution. Often smaller bored or driven concrete piles—or even foundations of quite a different kind—might have served, and in fact have done so at comparable cost. There are, however, occasional situations in which the engineer is attracted to the use of large cylinders as being the only feasible form of construction. With several jobs in central London it has been necessary to carry a tall building over a railway tunnel or a road. This has been made practicable by using piles capable of carrying loads of the order of 300 to 700 tons each. Sometimes it has seemed that this could best be achieved by using under-reamed piles, but where doubt as to their capacity would have made full load tests necessary the

economic balance has been disturbed in favour of straight shaft cylinders.

Another strong case for the use of these piles appears in a project still in the design stage where a 400ft. tower building might be carried on large cylinders or on a deep raft type of foundation with an area larger than that of the tower. However, because of the juxtaposition of an adjacent building it might be very convenient to use piles not only to carry the direct loading but also to form a retaining wall.

Conclusion

In deciding which type of foundation should be used the engineer is generally concerned with performance and cost. Therefore the limited knowledge of the performance of large diameter bored concrete piles under working load conditions is a distinct disadvantage.

Probably we do not know much more quantitatively about conventional piles but at least we have more experience and possibly the order of settlement may be markedly different. We must therefore proceed with both short-term and long-term study of the problem and not limit the study to large diameter piles but extend it to the performance of all forms of foundations to buildings, because any attempts to improve and rationalise foundation design must include study of their performance in the field. This need is only highlighted by present developments, it is not a consequence of them.

There is no doubt that large diameter bored concrete piles under-reamed or not do provide an economic and efficient answer to certain foundation problems, and although there is no clear-cut case yet for the use of a particular type of pile some pattern is emerging. In the interim and, no doubt, beyond, careful cost analysis will still be necessary—and the application of a good deal of common sense or to quote Terzhagi "thinking with the hips."

TESTING AND BEHAVIOUR

By W. G. K. Fleming

THE availability of large diameter piles in this country in recent years, and in particular of the under-reamed type of pile with its considerable economic advantages in certain cases, has provided engineers with a new means of bearing the heavy loads associated with the ever-increasing number of high buildings.

Because the principles upon which this type of foundation relies are not so evident as those of conventional piles or footings, it being a combination of both, engineers require to be satisfied that the basis of design used is satisfactory, and that the settlement of buildings founded in this way will compare favourably with those supported by other means.

A number of tests, of a magnitude not previously encountered, have therefore been carried out, but have given rise to much discussion because of apparent variations in their results.

At the present time there are differences of opinion as to the correct basis of design, in particular relating to the bearing capacity factor (N_c) to be used in determining the ultimate pressures at pile bases, the values of adhesion and effective shaft length to be used in calculating "shaft friction" load, and the factor of safety to be applied to control settlement.

Most of the information obtained so far concerns the London area, where soil conditions have been fairly widely investigated, and several tests have been aimed at the determination of the principles involved. However, little has been published on the subject and there has been a lack of guidance for those who have to organise tests, to enable them to work to best advantage.

It is not the author's intention to say how any particular test should be carried out, but to comment on experiences with a number of tests in the London area, hoping that this may help in the understanding of future, similar work.

Methods of Testing

In recent tests carried out by the author's company, it has been found satis-

factory to use a combination of kentledge and anchor piles to provide large test loads, generally providing kentledge reaction approximately equal to the working load of the pile, and arranging that there is no pull on the anchor piles up to this stage. Where anchor piles only are used, it would be necessary to keep them far from the test pile, since criticism may be made on the grounds that the true working load settlement is influenced by the secondary stresses they set up in the soil mass. The economy of the method, however, depends upon the availability of suitable kentledge at favourable cost near the site.

Where measured load cannot be directly applied, loads are generally measured by proving rings, electrical load measuring cells, or by gauges recording pressures in hydraulic rams. Proving rings offer the most reliable means of measurement, but with satisfactory checking, hydraulic pressure gauges and reliable jacks may often be found adequate. Electrical load cells have been used in attempts to measure load, both at a pile head and in a pile shaft immediately above an enlarged base, but because they are not yet suitably developed, and because they are more complicated to use, there is an element of risk with these which must be considered in relation to the cost of the work.

Settlements are generally measured by dial gauges mounted on suitably long and stiff datum frames, and are checked at frequent intervals by precise level as the frames are subject to possible disturbance and distortion by temperature variation.

Results

The author's company has been associated with tests on piles having shaft diameters ranging from 20in. to 48in. and base diameters of from 48in. to 126in. In most cases, test loads equal to one and a half times the working load were applied, but in a few cases they have approached ultimate values.

The method of calculating the working load of under-reamed piles has usually been to assume a bearing capacity factor, $N_c=9$, applying a factor of safety of 3 to this to obtain a working base pressure. To the end load has been added a shaft "friction" load based on an adhesion factor, $a=0.45$, and bond has been assumed ineffective to a height above the base equal to twice that of the under-ream. A factor of safety of 2.5 or 3 was generally applied to this latter component.

So far, the test results indicate that the ultimate base pressures assessed by this method are approximately correct, but settlements of from 10 to 40 per cent. of the base diameter may be associated with full ultimate load.

With regard to the ultimate adhesion between a pile shaft and clay, it would appear from tests, both on these piles and on conventional bored piles, that this has a wide variation from site to site, probably ranging from about $a=0.3$ to $a=0.8$. This variation may not be entirely random, but would seem to depend largely upon the physical properties of the clay, and in particular it may be associated with the silt content of the clay and the nature of fissuring. Full adhesion is also mobilised at small settlements, probably depending partially on the pile diameter, but for the most part of the order of 0.25in. The design method for this component is therefore based only on a very approximate figure. The allowance for ineffective shaft is also largely intuitive, but fairly wide variation of this does not usually affect the calculated working load appreciably.

The load/settlement diagram obtained is a compound of the diagrams applying to the adhesion, and end-bearing components and, except where under-reams are small, the ultimate adhesion may often be mobilised before a pile reaches its working load. Since this leads to small settlements for fairly large load increments in the early stages of a test, with a subsequently increased settlement for a given load when the ultimate adhesion is reached, it is clear that the settlement at total working load is very much influenced by the actual value of the adhesion co-

efficient. It is also the case that long isolated piles tend to show less settlement under particular loads than short piles of the same diameters, because of their greater shaft "friction."

It therefore seems probable that many of the inconsistencies that appear to exist between test results for piles of similar diameter on different sites are caused by the variations of the adhesion factor and length. However, it is necessary to appreciate that isolated piles under test will not behave as they do when closely spaced under buildings. In the latter case, a fraction of their load is transferred to the soil block above the bases, and will exert a vertical pressure through the soil at the pile base level. The remaining load will spread from the pile bases and, at a short distance below them, depending upon the spacing, will give pressures similar to those with conventional pile groups. The difference in settlement between conventional and under-reamed bored piles would therefore be expected to lie in the differential consolidation of the spreading zone under the actual loads applied by both systems. In general, with reasonable factors of safety, this difference is probably very small and the real causes of differential settlement will, for the most part, lie in the distribution of load within a particular structure and the general consolidation of the whole associated soil mass. The selection of pile length within limits may not be so important as test results indicate.

Comments on Test Procedure

Because under-reamed piles depend largely for their economy on the use of higher stresses in the concrete of their shafts than is usual with conventional piles, it is essential in any test on this type of pile, particularly where ultimate load is to be applied, that high quality concrete should be used.

The insertion of load cells above enlarged bases, or the use of mechanical means to provide both shaft and base load simultaneously, would give useful results for any large building scheme on a particular site. Until more research is carried out in the mechanism of the formation of adhesion bond between concrete and clay, such results would not be of general value.

During the application of any particular test load the time/settlement diagram is usually plotted. This may often give no indication of the final settlement under that load. At loads in the working range it may therefore be advisable to plot a graph of settlement against the square root of time, to give a better idea of the stages of consolidation. Because "topping up" of jacks causes some scatter of points during plotting, it may also be worth while to incorporate a constant pressure device into the hydraulic ram circuit where this type of loading system is used.

Where it is intended to apply ultimate loads to piles, the use of the "continuous penetration" system should be considered for loads outside the working range, as it is often not possible to distinguish between consolidation and plastic flow in the final stages of testing.

It is essential during any test to provide competent engineering supervision in order that the maximum amount of reliable information may be collected.

At the same time, it must be realised that tests of this kind will not alone provide all the information that engineers require, and it would be of great value if provision could be made for occasional accurate measurement of the settlement of structures during their construction, and subsequent life, where possible observing similar structures on conventional foundations as a basis of comparison.

CONCRETE CYLINDER RETAINING WALLS

By J. A. Derrington

THE large diameter cast in-place concrete pile has had such a large scale development of recent years, as an individual foundation supporting a load up to

(Concluded on page 1568)

RAPID CONSTRUCTION OF £2M. AINTREE FACTORY PROJECT

AT Aintree, Liverpool, building work on a £2 million cellulosic packaging-film factory is nearing completion in under twelve months.

The plant, consisting of eight new buildings, is for British Enka, Ltd., in the grounds of their existing factory. It will manufacture viscose-based transparent wrapping films.

Rapid construction was essential so that production could start as early as possible. Only six weeks after it was decided to use a scheme of precast concrete portal frames as the skeleton for the giant casting hall, the first section went into position on the site.

Piled foundations presented a problem: in various areas, highly explosive C.S.₂ gas, used in other parts of the factory, had seeped into the ground.

The impact of the piling hammer on the casing was on occasions sufficient to explode the gas, and flames would shoot up to 30ft. in the air. To prevent these explosions, C.O.₂ gas was forced into the holes to form an inert blanket over the tip of the pile, thus excluding oxygen and the possibility of it combining with the C.S.₂.

The atmosphere in the casting hall will be hot and very humid and, because of chemicals used, also very corrosive. Yet a single drop of condensation falling on to the film as it is being processed, could break the film and lose production time while it is rethreaded.

To solve the problem a suspended ceiling was added under the roof units, at a minimum slope of 12 deg. uniform with beam. Water will now run down the slope and not drop on to the cellulosic film.

Main Building

Three of the eight new buildings are joined to the company's existing factory. The main building is the giant casting hall. Here the matured viscose is extruded in a continuous sheet through a very fine slit in what is known as a "pouring hopper" and passes over and under a series of rollers through casting tanks where it is washed, bleached, softened and dried.

The casting hall measures 394ft. by 123ft. and consists of two halls flanked by 15ft. and 20ft. wide aisles in precast column and beam construction. The halls

will house machinery for film production and plant for processing the film after casting. External walls are of brick panels.

Attached to this building is the acid house, a three-storey steel-framed, brick-faced structure containing acid tanks, pumps and ancillary equipment. It covers an area of 65ft. by 29ft.

At the opposite end of the casting hall and a short distance away are 70ft. high coating towers. These steel-framed, asbestos-clad structures are to accommodate vertical coating and drying plant for the film. The coating tower blocks which measure 312ft. by 56ft. also house plant and equipment for the preparation and recovery of coating materials.

Viscose Cellar

Near the acid house is a single-storey brick-clad steel-framed structure, known as the viscose cellar which will store viscose before it is used in the casting hall. Completely insulated at floor, walls and roof, internal temperature will be closely controlled and the building, 87ft. long by 72ft., will have no windows or openings other than for access.

In the area between these four new buildings and those forming the extensions to the existing factory, a machine room and sub-station has been built over an area measuring 60ft. by 60ft.

At the beginning of June, 1960, it was decided to use for the construction of the casting hall, a series of two-pin portal frames, each consisting of two column pieces and a hipped beam. Details were finished rapidly, the moulds made and a start made on erecting the first frame on July 20.

The span of each portal was 44ft. 3½in. and the height from the base of the leg to beam apex 39ft., or 35ft. from finished floor level.

The hinges had to be held rigid during erection by incorporating four ½in. cold-worked bars each side. These passed through a 1½in. deep rebate and when the portal was complete and grouted up the hinges were released by cutting through these exposed bars.

Sockets were provided in the pile caps of the foundations into which the legs were lowered. They were then lined and levelled, guyed and wedged in position whilst the grout hardened.

The roof beam was placed on these and the extra stirrups fixed before concreting the joint. The length of the joint covered all the extreme positions for the point of contra-flexure. The members were so arranged that no shuttering was required for the in-situ concrete and that this work could take all the bending and shear at these sections.

The roof consisted of standard proprietary trough units, two being inverted at the crown to take extra bars and concrete for wind bracing. At eaves level special gutter sections had to be used and they were constructed with pockets for bars and in-situ concrete to form another line of wind bracing.

The erection gang was able to erect an average of three complete frames and bays of roof units per week. Some weeks they erected four and on one occasion five.

The south annexe columns fitted into similar pockets to those of the main frame and had corbels to support the mezzanine floor beams. Two standard types of beam were developed, one for the normal mezzanine floor load and one for use in the bays supporting heavy tanks. Only one type of floor unit was used and all bays with holes in or extra loads were cast in situ. The roof consisted of standard proprietary trough units and special gutter units.

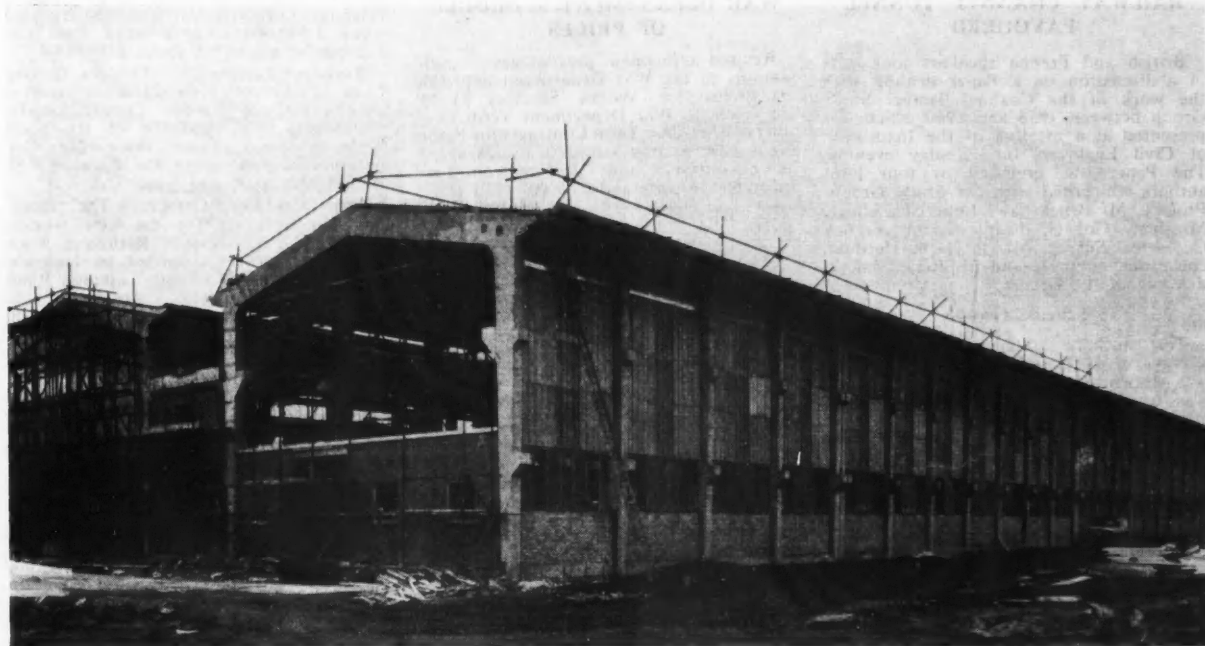
A similar type of construction was used in the central annexe, but no extra columns were required as the beams could span between the main frames. The span here was 20ft. whilst on the south annexe it was 15ft.

The north side of the building was provided with corbels and prepared to take future extensions.

Consultants and Contractors

Architects for the scheme are Harry Banister and Partners, 67 Rodney Street, Liverpool, 1, the consulting engineer being D. S. Grave, M.I.Struct.E., 158 Thomas Lane, Broadgreen, Liverpool, 14, and the quantity surveyors J. Youdan Briggs and Partners, Refuge Assurance House, 2 Lord Street, Liverpool, 2.

The main contractors are Holland & Hannen and Cubitts (North West), Ltd., New Chester Road, Bromborough, Ches.



394ft. long casting hall under construction

SMALLER ROAD IMPROVEMENT SCHEMES

More Wanted by A.R.A. Chairman

THE need to improve the ordinary roads was emphasised by MR. E. VIGOR, chairman of the Asphalt Roads Association, at the Association's annual luncheon in London last week. He said he sometimes felt that the Ministry were becoming obsessed with major developments, and overlooked the importance of smaller improvement schemes on which more money should be spent.

The chairman was replying to MR. JOHN HAY, Joint Parliamentary Secretary, Ministry of Transport, who stated that within the years 1956-60 the total expenditure in England and Wales on new construction and major improvement of roads had risen each year from £15m. to £26m., £50m. and £63m. In the next financial year it would be approximately £76m., rising again to £76m. in 1961-62 and to £88m. in 1962-63.

"The larger programme will enable the five major projects to be substantially completed during the next five years, and at least a start to be made on the Crick-Doncaster section of the London-Yorkshire Motorway," said Mr. Hay. "The expenditure on classified roads, the bulk of which will be spent in urban areas, will amount to £150m. in grant during the next five years, and annual expenditure at the end of this period will be nearly three times what it is at present."

Motorway Progress

Reviewing the progress of motorways the Joint Parliamentary Secretary stated that the London-Birmingham section, and the Preston and Lancaster By-passes were complete. The Staffordshire section and all the viaducts between Preston and Birmingham were under construction and work had started on the Lancashire and Cheshire sections. A scheme had been made for the Preston to Lancaster section and survey work was going on between Lancaster and Penrith. Preliminary work was being carried out on the connecting links in the Midlands. The Medway towns motorway would be started this year.

Work was also in hand on the reconstruction of the first section of the Heads of the Valleys Road to provide an effective link between South Wales and the end of the motorway at Ross. It was hoped that work would start on the Slough By-pass in the spring, and also on the viaduct section of the motorway from Chiswick to Langley.

Turning to urban improvements Mr. Hay said that a great deal was being done. Apart from the large schemes there were literally hundreds of smaller works in progress which all had an important role to play in fulfilling the Government's general policy of tackling the traffic problems of the country.

"As you will realise," he added, "this adds up to a lot of business for the contracting and civil engineering industries, and for the suppliers of materials such as yourselves. As far as I can see, the future of your industry is a good one."

No Cause for Complacency

The increase in road maintenance expenditure was welcomed by LORD DERWENT, chairman of the British Road Federation, who also spoke at the luncheon. But he warned against complacency. "The pounding that the road system is getting from the ever-increasing number of vehicles on it calls for constant vigilance. The skill to do the job is there and must never be thwarted for lack of money."

Lord Derwent pointed to the disparity between road user taxation and money spent on building new roads. In the year now ending the Treasury would have taken about £645m. in taxes and duties—about four times more than was being spent on the roads.

Referring to road authorisations, he said he was worried that the value of schemes to be authorised in Britain during the next year—some £75m.—lagged a long way behind the £100m. mark reached in the heyday of the road programme build-up period a year or two ago.

RAILWAY CHANNEL TUNNEL FAVoured

British and French speakers took part in a discussion on a Paper dealing with the work of the Channel Tunnel Study Group between 1958 and 1960 which was presented at a meeting of the Institution of Civil Engineers on Tuesday evening. The Paper was prepared by four joint authors concerned with the Study Group: Prof. J. M. Bruckshaw, Imperial College, M. Jean Goguel, head of the French Geological Survey, Mr. H. J. B. Harding, consulting engineer and M. Rene Malcor, delegate of the Group.

Scheme Feasible

The authors stated that from the surveys of 1958 and 1959 the conclusion was drawn that geologically, the scheme was feasible. The cheapest form of construction yielding the quickest return of invested capital would be a twin railway tunnel, using 25,000-V electric traction, which could, with modern signalling, pass one train every five minutes. Not only could it deal with all the rail traffic for many years to come, but could carry 1,800 vehicles per hour in either direction compared with 1,300 in a more expensive road tunnel.

Details of the construction methods examined by the Study Group and their recommendations were given in *The Contract Journal* on April 28, 1960.

WAR DEPARTMENT SCHEDULE OF PRICES

Revised adjustment percentages to trade sections of the War Department Schedule of Prices for Works Services (1948) applicable to War Department Term Contracts (other than Term Contracts for Painting and Decorating Services), also Measurement Contracts, and effective from February 6, 1961, are as follows:

Section	Trade	Percentage Addition
1	Excavator	173
2	Concretor	131
3	Bricklayer	135
4	Asphalter	72
5	Drainlayer	112
6	Mason	127
7	Pavior and Roadmaker	92
8	Roofer	108
9	Asbestos Cement Goods	107
10	Carpenter and Joiner	106
11	Ironmonger	110
12	Ironfounder, Smith and Structural Engineer	154
13	Gasfitter	137
14	Plasterer, Floor and Wall Tiler	122
15	Plumber	117
16	Electrician	114
17	Glazier	140
18	Painter and Decorator	132
19	Hutting	82

N.B. Where Section 20, Camp Structures, has been incorporated in the Contract, the Percentage Addition will be 82.

Late Construction News

£11m. STEVENAGE FACTORY.—A contract is about to be signed with G. Percy Trentham, Ltd., Rainham, Essex, for the erection of a £11m. factory at Stevenage, for Bowater Packaging, Ltd. The building will have a floor area of 340,000 sq. ft. Farmer and Dark, Romney House, Tufton Street, London, S.W.1, are the architects, and Gardiner and Theobald, 49 Bedford Square, London, W.C.1, are the quantity surveyors.

WATFORD FACTORY TENDERS.—Tenders from selected contractors are due in early April for the erection of a factory and office block at Bushey Mill Lane, Watford, for R. and J. Beck, Ltd. The architects are Dawe Carter and Partners, 33 Clarendon Road, Watford, and the quantity surveyors are V. B. Johnson and Partners, 16 King Street, Watford.

BRADFORD SCHOOL.—From six tenders received, Bradford City Council have accepted that of C. E. Cowen (Builders), Ltd., 12 Station Parade, Harrogate, at £104,354, for building the Holmefield Junior and Infant School. Work will start next week on the school, which will accommodate 320 juniors and 240 infants. James Cubitt and Partners, 25 Gloucester Place, London, W.1, are the architects.

PETERLEE HOUSING.—Peterlee Development Corporation have placed a contract with L. W. Evans (Contractors), Ltd., 18 Norfolk Street, Sunderland, for the erection of 106 two-storey houses and 66 garages at Chapel Hill IV site.

PROMENADE EXTENSION.—Subject to Ministry approval, Scarborough Property Committee have accepted the tender at £145,000 from Reed and Mallik, Ltd., Salisbury, for extension of the North Bay Promenade to Scalby Mills.

BATTERSEA DEVELOPMENT.—Battersea B.C. are inviting tenders from a selected list for the erection of an office block and two blocks of flats at Lavender Hill. Plans are by Howes and Jackman, 1 Verulam Buildings, London, W.C.1, and the quantity surveyors are E. C. Harris and Partners, Lynton House, Tavistock Square, London, W.C.1.

YORK GRAMMAR SCHOOL.—The tender of William Birch and Sons, Ltd., Spen Lane, York, at £197,400, has been accepted by York Education Committee for building new premises for Archbishop Holgate's Grammar School.

DREDGING IN ISRAEL.—A contract for dredging in the port of Haifa, Israel, has been awarded to Edmund Nuttall, Sons and Co. (London), Ltd., by the Haifa Harbour Authority. It involves dredging some 1,500,000 c.m. of sand from the harbour at a cost of about £300,000.

BARBICAN CLEARANCE.—Tenders ranging from £75,341 to £168,521 were received by the City of London Corporation for preliminary site clearance of six South Barbican areas. From these the Corporation have accepted the lowest by Sir Robert McAlpine and Sons, Ltd.

NEW DISTRICT OFFICE.—The superstructure contract for the new western district G.P.O. office at Rathbone Place, London, has been awarded to Lavender McMillan, Ltd., 54 Cheam Common Road, Worcester Park, who carried out the substructure work. Worth about £737,000, the contract provides for a reinforced concrete framed building of five storeys, including a penthouse.

PORTSMOUTH HOUSING.—Portsmouth City Council have accepted the £128,919 tender of H. E. Collins, Ltd., Eastern Road, Farlington, Portsmouth, for 50 houses and 44 garages at Wymering.

POWER STATION PILING.—A. Waddington and Son, Ltd., North Circular Road, London, N.W.10, have been awarded a contract for constructing about 50 planted cylinder foundations for the second extension to Coolkeeragh Power Station, Londonderry. The consulting engineers for the scheme are Kennedy and Donkin, 64 Royal Exchange, Manchester, 2, and Sir Alexander Gibb and Partners, Queen Anne's Lodge, London, S.W.1.

MANCHESTER INDOOR SWIMMING POOL

Opened Three Months
Ahead of Schedule



Wythenshawe indoor pool

A NEW indoor swimming pool, built at Wythenshawe by Manchester City Council to serve the surrounding housing and manufacturing estates, was officially opened recently by the Earl of Derby three months ahead of schedule.

The main entrance leads into a foyer from which two staircases give access to the first floor coffee lounge. Beyond the foyer is a restaurant which is separated from the bath hall by a glazed screen. This screen can be lowered into the basement to allow the restaurant to be used as an

extension to the pool area for special events.

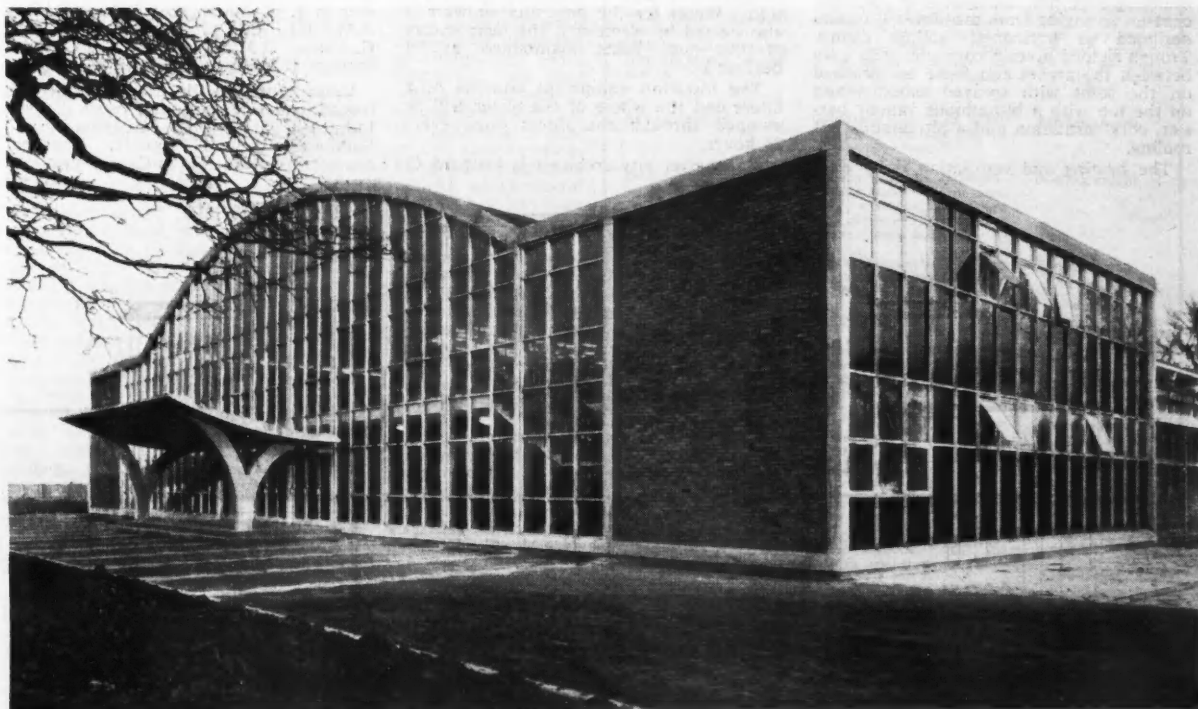
The pool, which is 110ft. by 48ft. wide, varies in depth from 3ft. 3in. to 12ft. Under-water windows have been incorporated in the bath walls for lighting and observation. A diving stage with fixed 3 and 5 metre boards and a 3 metre spring board is formed with two inclined concrete columns piercing two concrete platforms cantilevered in all directions.

The pool is flanked on two sides by tiered tip-up permanent seating to accommodate 828 spectators. Below the terracing is the dressing accommodation con-

sisting of 136 changing cubicles and "Hi-Gard-All" clothing storage for 564 bathers. The basement surrounding the pool varies in depth from 8ft. to 15ft. and contains the filtration, chlorination, heating and electrical equipment.

Foundations to the pool floor and basement are of mass concrete whilst the superstructure of the building is founded on concrete piles with ground beams spanning between them. The pool is formed with a 12in. thick reinforced waterproof concrete floor and 9in. thick side walls lined with white faience glazed tiling.

(Concluded on next page)



Exterior view of the building

In Parliament

GOVERNMENT TO SPEND MORE ON ROADS DURING 1961-62

THE 1961-62 Civil Estimates published last week show that Exchequer expenditure on the roads of Great Britain during 1961-62 is expected to be £136,629,580, an increase of over £15 million on this year's estimate.

A sum of £2,350,000 is provided for the purchase of land and the building of viaducts which are included in the first stage of the London-South Wales Motorway (M.4) between Chiswick and Langley. Part of the new road will be on a viaduct running for a mile and a half over the existing Great West Road, the total cost of this stretch of the motorway being about £7m.

Work is also to commence on the Slough By-pass (Langley to Huntercombe Spur), which will cost £4,350,000, the vote for next year being £1,650,000, and a further £254,000 will be spent on the Maidenhead By-pass.

A sum of £4,350,000 is needed for a section of the Bristol-Birmingham Motorway (M.5) in Gloucestershire and Worcestershire, and a further £19,350,000 is required for the £50m. Birmingham-Preston Motorway (M.6). Other large amounts, varying from £380,000 to £20,000, are needed for 15 improvement schemes on the A.1.

Next year, stage 2 of the Neath-Abergavenny Road reconstruction is to cost £575,000, and £2,910,000 in all. This is for the road running from Hirwaun to Dowlais Top; the reconstruction of the Brynmawr-Abergavenny sections is estimated to cost £1,559,000.

Grants to local authorities for improvements and maintenance of classified road

are to be increased from over £37m. to more than £45m. in England and Wales, and the vote for road research is to be increased from £150,000 to £225,000.

Engineering Research

The subject of research was raised by Sir H. Legge-Bourke during question-time in the Commons last week. He asked the Parliamentary Secretary for Science whether he was satisfied that the volume and quality in engineering was adequate to support the country's economy.

Replying, Mr. Denzil Freeth said he was not satisfied and that some branches of engineering would benefit from more research. At the same time, there had been an encouraging increase in both teaching and research in engineering in the universities and the technical colleges. The problem would not, however, be solved until the subject attracted a due proportion of the best intellects in the country.

Office Building (Survey)

Captain Litchfield asked the Parliamentary Secretary what was the purpose of the survey of modern office blocks, instituted by the Central Office of Information on behalf of the Department of Scientific and Industrial Research; what was the number of persons, directly or indirectly, engaged on this survey; and what would be its total cost.

Replied Mr. Freeth: The purpose is to analyse experience in the use of recent office buildings in order to improve

design of future buildings. Thirty part-time interviewers will be employed for one month under a senior information officer, and some technical staff for analysis of the data. Estimated cost of this survey is £5,500.

Captain Litchfield: Does my hon. Friend need this information? Does he not agree that investigations of this sort, even of a modest kind, should be reduced to those that are really essential?

Mr. Freeth: I think that this is a survey that can do a lot of good in making people happier in offices and, therefore, more efficient. We believe that a great deal more information is still needed on, for example, such aspects as the inadequacies of heating, lighting, ventilation and noise reduction.

House and Office Building

Questioned by Mr. F. Allaun, the Minister of Works, Lord John Hope, said that in 1960 the proportion of the building and civil engineering industries' resources devoted to building council houses was estimated at 10 per cent., and for offices at between 2 per cent. and 3 per cent. In 1950 the proportion for council houses was estimated at 20 per cent.; the figure for offices was 1 per cent.

Mr. Allaun: Do not those figures show—and, in any case, is it not manifest—that while office building is soaring, particularly in London, Manchester and other cities, council-house building has been slashed by the Government's policy, thus leaving in a hopeless condition hundreds of thousands of families who cannot afford to buy their own homes? Will the Government therefore revise their priorities?

Lord John Hope: Revision is a matter for the Minister of Housing, but I would not have thought that the hon. Member was wise to use those figures for criticising the Government's housing policy. The point is that 26 per cent. of the resources of the industry are still being used for building houses.

(Concluded from previous page)

The main roof of the building consists of in-situ concrete arches 14in. by 12in. spanning 82ft. 6in. and spaced at 13ft. 4in. centres, springing from cantilever L frames designed as horizontal hollow beams. Trough shaped precast concrete units span between the arches and these are finished on the soffit with sprayed asbestos and on the top with a bituminous vapour barrier, cork insulation and a bituminous felt roofing.

The heating and ventilation is by elec-

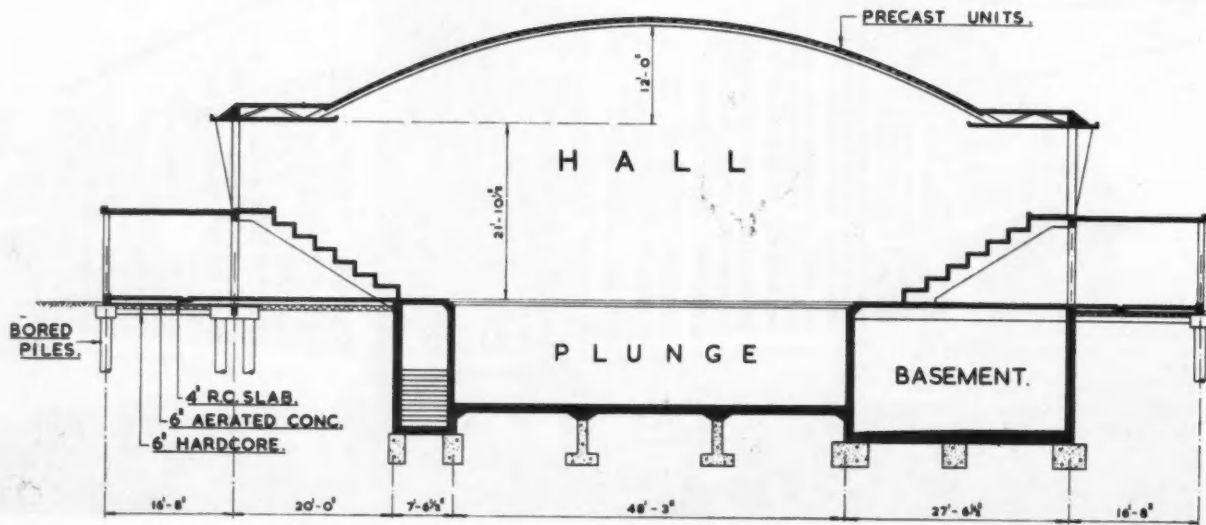
tricity and consists of embedded floor heating supplemented by a hot air ventilation system calculated to maintain even temperatures and to eliminate condensation. Water for the pool and showers is also heated by electricity, the temperature of the pool being maintained at 74 degrees F.

The filtration equipment consists of 8 filters and the whole of the water will be pumped through the filters once every 2½ hours.

Manchester city architect is Leonard C.

Howitt, M.Arch., D.A.(Manc.), Dip.T.P., D.P.A., F.R.I.B.A., the deputy city architect is S. G. B. Roberts, Dip.Arch., A.R.I.B.A., and the chief assistant architect is J. S. Marsh, Dip.T.P., A.R.I.B.A., A.M.T.P.I., the project architects being G. Carter, D.A.(Manc.), A.R.I.B.A., and N. Stanley, D.A.(Manc.), A.R.I.B.A.

Consultants for the design of the reinforced concrete structure were Truscon Ltd., and the quantity surveyors were T. Sumner-Smith and Partners. The main contractors were Simon-Carves Ltd.



Typical cross section

BUILDING RESEARCH STATION

DIGEST No. 8

Built-up Felt Roofs

BITUMEN roofing felt, provided it is of suitable quality and properly laid, is an efficient and durable form of roof covering. Many roofs of this kind have remained serviceable for 20 years or more with little need for maintenance or repairs. On the other hand there are others which, for a variety of reasons, have become defective, sometimes quite early in their life, causing leakage and other troubles.

With due care, these difficulties can be avoided. The recommended precautions will be included in a revised issue of the British Standard Code of Practice for Bitumen Felt Roof Coverings (CP 144.101: 1952). Meanwhile, the purpose of this Digest is to explain the reasons for the defects and to show how they can be overcome.

Roofing felt may be used as a single thickness, for temporary structures such as sheds, but for any permanent construction, two or three layers of felt are usually bonded together on site to form "built-up" felt roofs.

Types of Felt

Roofing felt consists of a mat of organic or inorganic fibres impregnated, and usually coated, either with bitumen or with fluxed coal-tar pitch. In B.S. 747: 1952 (Classification of roofing felts), the felts are grouped in four classes:

1. Bitumen felt (fibre felt)
2. Bitumen felt (asbestos base)
3. Fluxed pitch felt
4. Impregnated flax felts and hair felts.

Built-up roofing work in this country has been concerned almost exclusively with Classes 1 and 2, but bitumen felts based on glass fibre are now available and will no doubt be included in the current revision of the Standard.

Class 1 includes six types of bitumen felt, the description, uses, normal weight and standard packages of which are given in the Standard. The types are:

- (a) Saturated
- (b) Sanded
- (c) Self-finished
- (d) Coated and sanded
- (e) Mineral-surfaced
- (f) Reinforced

Class 2 includes only (a) "Saturated" and (b) "Self-finished" bitumen asbestos felts.

Durability

As already stated, bitumen roofing felt of reputable quality, when properly used, can be expected to last for many years. Some of the felts made under the "austerity" conditions of the last war gave relatively poor service, but these are not representative of the general run of production before or since.

When felt roofing fails to give satisfactory service, the failure is generally due to incorrect use of the material, or neglect of the necessary precautions, rather than to poor quality felt. If, for example, no suitable provision is made against the movements of the sub-structure of the roof that result from drying shrinkage or thermal changes, the felt may be stretched beyond its capacity, and crack or tear. Again, defects may arise through the entrapment of large amounts of water under the felt, or through excessive condensation on the underside. Effects such as these usually occur long before the felt shows any serious deterioration as a direct result of exposure to the weather.

The long-term effect of exposure is to cause a gradual loss of bitumen from the surface; crazing and pitting may eventually occur, allowing access of moisture to the fibre, and deterioration may then be

accelerated. The felt also loses flexibility on exposure and so becomes more liable to crack. Walking on old felt that has become blistered or wrinkled may cause cracking and subsequent leakage.

The slope of the roof has an important influence on the durability of the felt. In the first place, deterioration is more rapid on flat surfaces than on inclined surfaces; secondly, if rainwater is not able to drain off completely, but stands on the roof in pools, it hastens the breakdown of the felt and may also cause pimping or blistering, and loosening of grit from the protective surface dressing. Bitumen felt, therefore, should never be laid on a completely flat roof; a fall of not less than 1:60 (2in. in 10ft.) is essential, with provision for complete drainage.

So far as present experience goes, the life of felt is little influenced by the type of fibre used—organic fibres, asbestos or glass. Those based on asbestos or glass, however, have better dimensional stability than those based on organic fibres, and so are less liable to cockle where the felt is not fully bonded to the roof.

Choice of Felt

Built-up felt roofing will generally consist of two layers of felt on pitched roofs, or three layers on flat roofs.

For the lower layers, the choice lies between the following types:

1(b) Sanded felt, of not less than 45lb. weight per 12 sq. yd.

1(c), 2(b) Self-finished felt (or an equivalent type based on glass fibre), of not less than 30lb. weight

1(d) Coated and sanded felt, of not less than 45lb. weight.

If semi-finished felt is used, some roofing contractors prefer to use a felt coated with a light dusting of sand instead of the talc normally used to prevent sticking in the roll, because they consider that the sand coating gives a better bond to the roof deck and so helps to avoid blistering. In that event, allowance should be made for the additional weight of the sand in specifying the weight of the roll, which should then be not less than 40lb. per 12 sq. yd. Saturated felts, particularly those based on organic fibres, are not recommended for the lower layers of a built-up roof in damp climates, because they tend to hold moisture and may cause blistering.

The type of felt for the top layer depends to some extent on the slope of the roof. On roofs with a slope of not less than 1:6 (10 degrees), mineral surfaced felt (type 1(c), or the equivalent material based on asbestos or glass fibre) is recommended, but not for roofs of lower pitch because the slower drainage tends to cause loss of the protective granule surfacing. For slopes of less than 1:6,

therefore, it is better to use for the top layer one of the types listed above for the lower layers, in similar or heavier quality, and to apply an additional surface dressing in situ. This consists of an application of "cut-back" bitumen (a solution of bitumen in a volatile solvent), blended with $\frac{1}{2}$ in., or $\frac{3}{4}$ in. mineral chippings. The chippings should preferably be white or light in colour, so as to keep the felt and the underlying structure cool in sunny weather to minimise thermal movements.

Fire Protection

Although bitumen felt is a combustible material, the degree of fire protection afforded by a built-up roof depends upon the roof structure as a whole. Requirements relating to the ability of a roof covering to afford protection against the spread of fire into the building or to adjoining buildings are laid down in both the English and the Scottish Model By-laws, and examples are quoted of various felt-covered roofings that would be deemed to satisfy the By-laws; the list does not purport to be exhaustive.

Since the two Models were issued, methods of test have been standardised, in B.S. 476, Part 3:1958, to enable roofs of any type to be classified in one or other of various grades according to their performance under exposure to external fire. Although the grading has not yet been incorporated into the By-laws, it may well become an accepted means of interpreting their intention. The testing of roofs to this Standard is undertaken by the Joint Fire Research Organisation at the Fire Research Station, Boreham Wood, Elstree, Herts.

A list is being prepared of those roofs that have already been tested, including a number of felt roofs. Although the full range of felt roofs has not yet been examined it is known that with a suitable choice of decking, felt and surface treatment, the highest grading of the Standard can be attained. The list is expected to be available shortly; in the meantime, reference may be made to the Fire

Table 1
RECOMMENDED CONSTRUCTIONS

Roof decks	Treatment before laying felt	Method of fixing first layer
Aerated concrete screeds, or lightweight aggregate concrete screeds, on dense concrete slabs, precast concrete beams, hollow pots etc.	1-in topping of 1:4 cement: clean coarse sand, laid in alternate bays not exceeding 100 ft ² (see Note 1). Drain tubes through the deck and ventilators may also be required.	Partial bonding. Where cuts are made in the topping (see text), strips of felt to be laid along the cuts.
Asbestos cement	Fibre insulation board, laid to break joint, bonded with hot bitumen (see Note 2).	Bonding overall
Dense concrete, shell roofs, etc.	Nailing battens should be provided at the top of steep slopes. Fibre or cork insulation board may, if required, be bonded to the roof when surface dry.	Bonding overall
Metal deck	Fibre insulation board, laid to break joint, bonded with hot bitumen (see also Note 2).	Bonding overall
Compressed straw slabs	Tape joints	Bonding overall
Wood boards	If additional insulation is needed, insulation board, laid to break joint, may be fixed. See Note 3.	Nailing
Woodwool slabs	1-in topping of 1:4 cement: clean coarse sand, laid in alternate bays not exceeding 100 ft ² .	Partial bonding. Where cuts are made in the topping strips of felt to be laid along the cuts.

NOTES

1.—With aerated concrete screeds, some manufacturers recommend priming the surface in preference to a cement:sand topping; either method is permissible.

2.—If conditions within the building are warm and humid, a layer of felt, bonded to the deck below the fibreboard, should be laid to act as a vapour barrier.

3.—Special attention should be paid to the following recommendations from B.S. Code of Practice CP112—The structural use of timber in buildings: the boards, butt-jointed or tongued and grooved, should be fixed with two nails in each board at each joint to minimise curling. The wood should be below 15% moisture content when laid. Ventilation of the roof space is essential.

Research Station, or to the manufacturers, for roof systems that can be expected to meet specified gradings.

Roof Construction

The various kinds of roof decks on which built-up roofing can be laid are listed in Table 1 with the appropriate methods of treatment. For example, some that are thermally insulating in themselves require a topping of cement and sand, and the felt is laid on this; with others, the thermal insulation, where necessary, is provided by means of materials such as fibre insulating board, or cork, on which the felt can be laid direct.

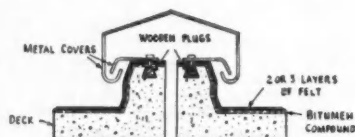


Fig. 1. Twin-kerb expansion joint for major movement

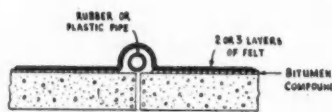


Fig. 2. Expansion joint for moderate movement

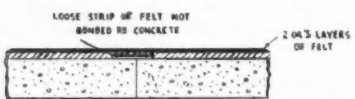


Fig. 3. Flat expansion joint for minor movement



Fig. 4. Expanding nail

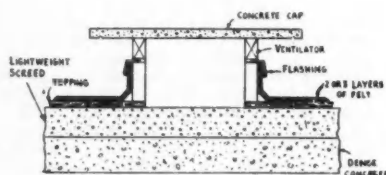


Fig. 5. Brick box ventilator

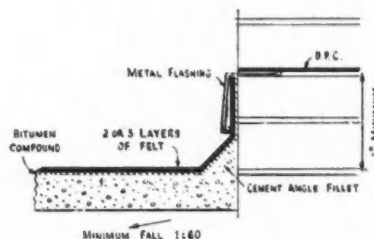


Fig. 6. Treatment of upstand

In the construction of roof decks, the following three points call for special consideration since they have an important bearing on the performance of the felt covering and the efficiency of the roof as a whole.

Moisture and thermal movement

It was mentioned earlier that tearing of the felt can be caused by movement of the underlying structure, especially drying shrinkage and thermal movements. Since these cannot be eliminated entirely, special precautions are necessary in laying the felt to minimise their effect, and these are indicated below; in addition, everything practicable should be done to ensure that the movements themselves are kept to a minimum. To control the drying shrinkage in screeds or topping the mix should not be richer than 1:4 and it is important that the sand should be clean, well graded and fairly coarse. The water content of the mixes should be no more than is necessary for placing, compacting and finishing. If it is feasible to allow the decking to dry and shrink before the felt is laid, the risk of damage will be further reduced.

Thermal movements of a concrete decking or topping are best controlled by a white or light-coloured treatment applied to the felt after it is laid, e.g., a layer of light-coloured grit or stone chippings, or decking slab; movement joints should also be provided in large areas of concrete decking.

Constructional and rainwater

While any porous decking, if left exposed to the weather, can absorb large quantities of rainwater, there is an additional risk with concrete screeds made with lightweight aggregate, because of the large amounts of water used in their construction. Once the felt has been applied the entrapped water, whatever its origin, can

escape only very slowly, and its effects may continue for many months or even years. Apart from any visible effect, moisture retained in the structure reduces the thermal insulation and so encourages condensation, thus defeating the purpose of the insulating screed. It may, moreover, create a serious nuisance by causing stains, or even appearing as drips, on the ceiling below; also, in sunny weather, the pressure of water vapour may cause the felt to blister.

Since, in this country, the weather is seldom favourable enough to allow the concrete to dry before the roof covering is laid, every practicable step should be

can be done quite effectively with a bitumen solution without causing adhesion of the particles. Silicone solutions, silane vapour, wax solutions or emulsions, or aqueous solutions of ammonium stearate have given similar promise in laboratory tests. Experimental roofs have been successfully laid with a lightweight aggregate treated with a bitumen solution. So far there has been no experience on a larger scale by which to judge whether advantage to be gained would warrant the cost of the preliminary treatment.

Lightweight concrete slabs, insulating boards, compressed straw panels, wood-wool slabs and other absorptive materials intended to be incorporated in the roof structure should be stored under cover and should be fixed in sections as the roof covering is proceeded with, so that each section may be covered without delay. Wherever possible, tarpaulins or polythene sheets should be used to protect uncovered sections in wet or showery weather.

Condensation

Moisture condensing within the thickness of the roof structure under built-up roofing can, if the condensation is heavy and long-continued, produce much the same effects as water entrapped originally. The most extreme effects, associated with saturation of the insulating material, are seldom likely to occur except in buildings where industrial processes either require, or inevitably produce, a warm, humid atmosphere—for example, in textile or tobacco factories, laundries and bakeries. In such buildings, the design of the roof to obviate condensation calls for very careful consideration (Digest 117).

In other buildings such as shops, public halls and dwellings, there are periods of high humidity when condensation is liable to occur. A minor effect is pattern staining on ceilings, but at times there may be sufficient condensation to cause dripping from the underside of an impervious roof deck. A wise precaution is to have more thermal insulation above the roof deck than below it. A vapour barrier should be included in any decking containing organic insulating material (Table 1), to prevent this from becoming saturated and rotting.

Preparation for Fixing

Recommended preparatory measures for roofs of different kinds are outlined in Table 1 and particular attention is directed to those relating to lightweight concrete screeds and woodwool slabs.

Observations on roofing felt laid on these materials demonstrate that the practice of bonding the felt to a blinding coat of slurry often leads to cracking of the felt in places where shrinkage cracks develop in the roof structure. Felt laid directly on aerated concrete is sometimes prone to blister.

For these reasons, it is recommended that a 1 in. topping of one part of cement to four parts of clean, coarse sand should be used, and that this should be laid in alternate bays, each of not more than 100 ft.². For aerated concrete screeds, however, some contractors prefer to prime the surface with a bitumen primer instead of using the topping, and this is permissible.

Since shrinkage cracks often develop along the line separating two areas of roofing of different widths, or at junctions between lengths of roof, or in places where the run of the roof is interrupted by rooflights, it is further recommended that cuts should be made in the topping and preferably through the full depth of the screed along the lines of such junctions and along lines joining the adjacent corners of rooflights, and that any large areas of topping should be similarly subdivided at junctions between the bays.

Apart from providing a fair surface for adhesion of the felt and facility for correcting any inadequacy in fall, the purpose of the topping is two-fold. It aims to restrain the drying shrinkage of the woodwool slab or lightweight concrete screed and also to encourage any cracking of the topping to occur along the lines of the cuts rather than in random directions

taken to reduce the water content. Drainage tubes, inserted in the structural roof and left open until the ceiling is plastered, are of great benefit in reducing the amount of water retained. Such tubes will not, of course, drain out all the water. Provision can be made for its ultimate escape by leaving apertures in the felt covering and building brick-box ventilators over these (Fig. 5), but even then the rate of drying is slow because the moisture has to escape by diffusion through the screed and may have a long way to travel.

A practice known to have given satisfactory results is as follows. The structural deck is drained so that no ponds can form on it. This may be done by inserting drainage tubes at the time of construction; alternatively, the roof may be flooded and the deck punctured at the centre of all ponds. An insulating screed consisting of cement and no-fines lightweight aggregate (e.g., sintered pulverised-fuel ash) is then laid, followed by a thin 1:4 cement:sand topping, just sufficient to bring the screed to a fair face. The screed can then be allowed to mature until conditions are suitable for the roofing felt covering to be laid. Any rain penetrating the screed will mostly drain away. One or two ventilators may still be needed to complete the drying.

It has been suggested that more efficient drying might be achieved if the screed were laid around inflated tubes that could be subsequently withdrawn, to form ducts connected to small ventilators at the edges of the roof. No trials of this method have yet been carried out.

A method that has been suggested for reducing substantially the water needed for lightweight-aggregate concrete is to waterproof the particles in advance by immersing the aggregate for a few moments in a water-repellent liquid and allowing it to dry (British Patent 824 592). This

across the slab. Subsequently, loose strips of felt should be laid along the lines of the cuts (Fig. 3) to prevent adhesion of the overlying felt for a distance of 6in. to 9in. on either side. The aim here is to allow the felt to stretch rather than tear in response to any small movements that may occur in the topping. The method illustrated in Fig. 2 is better where there is likely to be any considerable movement. Expansion joints in the roof structure should preferably be of the twin-kerb type (Fig. 1).

No special comment is called for in regard to the other decks dealt with in Table 1, except to mention that the layer of insulating board used on metal or asbestos decks is necessary to facilitate bonding and to prevent tearing of the felt.

Fixing

Methods of fixing are also set out in Table 1. The surface should be clean, free from dust or debris, and at least surface-dry at the time of laying. Except for wooden boarded roofs, where the first layer is nailed and should not be bonded to the boards, roofing felt is customarily bonded to the roof with hot bitumen spread at the rate of about 30lb. per 100ft.². On highly absorptive surfaces, this is preceded by an application of a bitumen primer to reduce frothing of the bitumen and assist adhesion. The primer must be allowed to dry before proceeding.

It is seldom essential that the felt should be bonded overall, but there should be sufficient bonding to prevent lifting and tearing of the felt in high winds. Where there is a substantial loading of tiles or stone chippings, it may be enough to bond the edges of the strips of felt. For fixing to the cement-sand topping recommended for use over lightweight concrete screeds or woodwool slabs, partial bonding at the edges and in strips or spots elsewhere is preferable to overall bonding, since this gives the felt more scope for stretching in response to any differential movement in the roof slabs.

The suggestion for partial bonding applies only to the first layer of felt, and is intended principally for roofs incorporating lightweight screeds and woodwool slabs. Partial bonding is essentially a precautionary measure imposed by the impossibility of predicting precisely where cracking may occur. It is not necessary or

desirable to use partial bonding where the felt is laid on fibre insulating board, cork or compressed straw slabs.

Partial bonding may also be achieved by using a proprietary underlay perforated with holes about 1/4in. in diameter and gritted on the undersurface. Hot bitumen is spread over this so that the bonding of the felt to the roof is restricted to the areas of the holes in the underlay. The gritted under-surface provides a continuous air space through which vapour can escape at the verges, thus preventing a build-up of pressure beneath the felt.

A form of expanding nail (Fig. 4) has been introduced for nailing felt to lightweight concrete of medium strength without a topping, but there has not yet been much experience of its use. Because of the alkaline character of concrete, nails in an aluminium alloy would be unsuitable for this purpose.

Upstands at parapet walls, etc., need careful detailing to exclude rain. The upstand, which should be at least 6in. high, should preferably be covered with a metal flashing as shown in Fig. 6. Where there is a damp-proof course in the wall, the flashing should be made continuous with it. Bends in the felt in these or similar circumstances should be supported, preferably with a wood or mortar fillet.

Where the edges of a roof are finished with a kerbing under the felt, the development of shrinkage cracks in the joints of the kerb may lead to tearing of the felt. Laying a loose strip of felt over each joint (Fig. 3) to break the bond with the overlying felt will reduce this risk.

Roof Paving

Where a built-up roof has to carry much traffic, a more substantial surface is needed. This may be of tiles bedded in bitumen, or a topping of bitumen macadam not less than 1/2in. thick or a mortar screed not less than 1in. thick may be used. Since there must be enough freedom of movement in tiling or screed to prevent lifting or arching under the combined effects of thermal and moisture movement of the roof structure, tiling or screed should be laid in areas of not more than 100ft.², and these areas should be separated by 1in. joints. Tiles should be butt-jointed. Each area of mortar screed should be subdivided into units not larger than 2ft. by 2ft. by cutting through the full

thickness of the screed before it has set and hardened. Subsequently these cuts and the joints between the separate areas should be filled with a bitumen jointing compound.

Treatment of Defects

The appearance of dampness, or even of water drips below a built-up roof does not necessarily mean that the roof covering is leaking, for these defects can also be produced, as already explained, by water entrapped originally or even, sometimes, by heavy condensation of water within the roof structure. If, therefore, on careful inspection, the felt covering appears to be intact, these possibilities should be considered, remembering that water can remain entrapped for many months after the covering has been laid.

There is no quick way of drying out a roof that, from any cause, has become waterlogged. If water is dripping from points in the ceiling or, as often happens, from electric conduits, holes may be bored near the places affected, to assist drainage. Drying can also be assisted by building brick box ventilators (Fig. 5) on the roof at appropriate places.

If the conditions within the building are warm and humid, condensation may be suspected; if it is in fact the cause of the dampness, the only remedy, in severe cases, may be to provide more thermal insulation and an effective vapour barrier. In milder cases it may be sufficient, if practicable, to improve the ventilation of the building.

Sources of dampness caused by cracking or deterioration of the felt or failure to cover upstands with flashings can usually be traced by inspection. Where the felt has become torn or cracked but is otherwise in good condition, patching on the lines indicated in Figs. 2 or 3 will be well worth trying; it can best be undertaken by a specialist contractor. Other defects can be dealt with by the methods given in Table 2.

If there is reason to think that thermal movement of the roof has been a contributory factor in damaging the felt, it may help to prevent a recurrence if, after repair, the felt is covered with a layer of light-coloured grit to reflect solar heat.

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£2M. PROGRAMME BY BRISTOL ENGINEER'S DEPT.

Major contracts totalling over £2 million are scheduled to be started this year by the Bristol City Engineer's Department.

Most of this money is to be spent on the City's main drainage project, and contractors have already been asked to submit their names for a selected list to be invited to tender for a 2,000yd. culvert to cost about £500,000. Two other contracts—for the construction of a power station and sludge digestion tanks, etc., £400,000, and for 16 sedimentation tanks, detritus channels and ancillary equipment, £800,000—are expected to go out to tender in mid-summer with a view to work commencing in the autumn.

The department's roads programme is of course subject to Ministry of Transport grant authorisation. It provides for duplication of Bedminster Bridge, £160,000, and the improvement of Passage Road to form part of the new Filton By-pass, £180,000.

Looking further ahead, the Department hope that a start will be made in the financial year 1962/63 on the Cumberland Basin Bridges scheme, the total estimated cost of which is £2,300,000.

Mr. J. B. Bennett, M.I.C.E., M.I.Mun.E., is the city engineer and planning officer.

HOLBORN BOTTLE-NECK TO GO

The Minister of Transport, has made a grant of £154,350 to the London County Council towards the cost, estimated at £205,800, of widening a length of High Holborn (A.40) on the south side, to provide a carriageway 35-45ft. wide.

Table 2
DEFECTS IN BUILT-UP FELT ROOFS

Defect	Cause	Remedial treatment
Tearing or cracking	1. Differential movement at cracks or joints in the substructure 2. Perforation of unsupported felt 3. Perforation of blisters by traffic 4. Sharp bends in felt	1. Adopt details shown in Figs. 1, 2 or 3. If defects extensive, re-lay over fibre insulating board. 2. Provide a supporting fillet and patch with felt 3. Cut, bond down and patch over blister 4. Round off and patch, or use a metal flashing
Pimpling on top layer of felt, eventually breaking open and exposing fibres	Expansion of more volatile fractions of bitumen, or of air or water, in sunny weather. May occur with self-finished felt, particularly where pools of water can stand on it, or with mineral-surfaced felt laid at too low a pitch.	In serious cases on felt roofs, dress with cut-back bitumen and grit
Blisters between layers of felt	Expansion, in sunny weather, of entrapped air or water	Cut the blister, re-bond and patch. If the trouble is persistent, a heat-reflecting treatment, or the weight of a heavy dressing, may help.
Blisters between felt and deck	Expansion in sunny weather, of entrapped air or water. Particularly liable to occur on surfaces such as lightweight concrete screeds or asbestos cement, if not dealt with as in Table 1.	
Cockling and rippling	Moisture movement of either felt or roof, especially where felt is not bonded	Little can be done, except to re-lay. Site dressing, using a fair weight of grit, may make the defects less conspicuous.
Lifting of laps	1. Bad bonding initially 2. Pulling as a result of formation of blisters	1. Re-bond 2. Cut, bond down and patch
Local deterioration associated with ponding	Inadequate fall, or obstruction of outfall	Clear outfalls. Site dressing with coarse grit may limit further damage
Arching of tiles, screeds, etc.	Inadequate allowance for thermal or moisture movement	Provide 1-in gaps around bays of about 100 ft ² and fill with a bitumen compound. If necessary, rake out old compound and re-point.
General deterioration and embrittlement	Premature deterioration indicates inadequate falls, wrong choice of felt, neglect of any recommended surface dressing, or wrong laying.	Re-lay if deterioration is far advanced; if not, site dress with cut-back bitumen and grit
Loss of grit	1. Site dressing in adverse weather conditions 2. Use of hot bitumen or emulsion instead of back bitumen 3. Inadequate fall	Site dress, using cut-back bitumen and fairly coarse grit

Men and Movements

CHAMBERLAIN INDUSTRIES, LTD., have announced the forthcoming departure to the United States and Canada of **Mr. R. R. Watkins, M.S.M.A.**, the newly appointed sales director, and



R. R. WATKINS

J. F. BEDFORD

the company's chief engineer, **Mr. J. F. Bedford, A.M.I.Mech.E.** While the primary purpose of the tour is to generally promote the sales of the redesigned hydraulic motors and also pipe bar and section benders, visits will be made to the company's agents in Michigan and in Montreal.

Mr. C. G. F. Hazell, chairman of Taylor Woodrow (Ghana), Ltd., and of Taylor Woodrow (Sierra Leone), Ltd., will leave London Airport on April 1, to visit Taylor Woodrow contracts. He will be in Sierra Leone at the time of the Independence celebrations.

Mr. S. Anantharamakrishnan, chairman and managing director of Simpson and Co., Ltd., Madras, recently visited the headquarters of the Perkins group of companies at Peterborough for discussions with **Mr. M. I. Prichard**, managing director of the group. **Mr. W. W. Ladd**, O.B.E., chairman and managing director of Wallace Cartwright and Co., Ltd., Simpson's London subsidiary, accompanied Mr. Anantharamakrishnan. They met **Mr. T. H. R. Perkins**, acting director of production, and other Perkins directors and senior officials, including **Mr. J. Winstanley**, general overseas manufacturing manager.

The Bromford Iron and Steel Co., Ltd., of Bromford Lane, West Bromwich (Staffs), is in the process of internal re-organisation to meet the additional volume of business expected when the company's new cold rolling mill is commissioned at the end of April. Emphasis is being laid on the sales side of the organisation and **Miss Dorothy Morris** has joined the company as commercial manager. The sales force has been joined by **Mr. R. Robson**. He becomes assistant to **Mr. Harold Thomas**, the Midland area manager. **Mr. Peter Strong** now leaves the Midland sales force to become London area manager.

Recently Fred Myers, Ltd., and The Leverton group of companies have merged their Caterpillar Tractor Co. interests and, in respect of these interests, are trading as H. Leverton and Co., Ltd. This merger now facilitates the further expansion of the activities of Fred Myers, Ltd., for the sales and servicing of the range of Hyster and Hyster-Ransomes equipments. As an initial step in a comprehensive expansion programme, **Mr. J. W. Packer** joins the sales department to represent the company in the City, south west and western areas of London. Mr. Packer was previously a



J. W. PACKER

B. PAYNE

senior Caterpillar tractor representative. **Mr. J. Nichols**, as sales promotion manager, will now concentrate all his promotional activities to Hyster and Hyster-Ransomes sales. After nearly 12 months as a service engineer, **Mr. B. Payne**, now takes up the appointment of sales representative for the south west counties and Bristol.

Philips Electrical, Ltd., have announced that **Mr. E. J. Ellett** has joined their south east region's sales force as an ELA representative and will thus be concerned with the selling of sound equipment installations. Prior to being transferred to the sales force, Mr. Ellett, who joined Philips in 1950, was employed in their central service department.

Mr. David Evans has been appointed northern area manager of the building equipment division of Scaffolding (Great Britain), Ltd. Mr. Evans will be responsible for the hire and sale of SGB building equipment through the company's depots at Bradford, Hull, Leeds, Liverpool, Manchester, Preston and Sheffield.



D. EVANS

Mr. M. C. Cole, F.C.A., and **Mr. W. Stalley, F.C.I.S., F.A.C.C.A.**, have been appointed directors of Permanite, Ltd. Mr. Stalley joined the staff of Permanite 27 years ago. He was appointed secretary in 1951, and continues as such.

Coventry Compressors, Ltd., have appointed **Mr. T. K. Jenkins** as manager of the new diamond drilling division. He has resigned his position as technical manager of Holemasters, Ltd.

Mr. E. T. Sermon, managing director, **Mr. R. Lamb**, director and **Mr. D. C. Burstow**, secretary of W. J. Simms Sons and Cooke, Ltd., are flying out to Canada to visit the subsidiary company in Toronto.

A number of new appointments have been made by Bowmaker, Ltd. **Mr. T. A. Wits** becomes resident representative of the branch at Newbury. **Mr. P. H. M. Cooper**, hitherto assistant manager at London, has been appointed manager of Harrow branch. **Mr. F. R. Pitman**, previously sub-manager at Canterbury, has been appointed manager of Portsmouth, and **Mr. C. R. J. Young**, representative at Croydon, has been appointed sub-manager at Canterbury branch.

S. Wernick and Sons, Ltd., have appointed **Mr. W. H. Paget-Brown** as their representative for Derbyshire and Nottinghamshire. He has recently returned from the Continent where he represented British and American companies.

At the recent general assembly in Brussels of FEROPA—Fédération Européenne des Syndicats de Fabricants de Pannaux de Fibres—**Mr. C. Geoffrey Cullen**, director of the building products division of the Bowater Organisation, was re-elected as president for 1961-62. This is his third term of office.

N. V. Nederlandsche Linoleumfabriek have formed a British subsidiary, Krommenie Flooring (U.K.), Ltd., with a London office at Clifton House, Euston Road. The managing director is **Mr. Michael M. Faulkner**.

Millars' Machinery Co., Ltd., have announced the appointments of **Mr. R. G. Williams** as sales representative for Wales (concrete division); and **Mr. E. G. Wilkin**, formerly with John Brown Land Boilers, Ltd., as commercial manager of the company.

Mr. L. H. E. Jones, export sales manager, Expandite, Ltd., leaves London on April 2 for a tour of Canada, United States, Central and Southern America and the West Indies. During his stay he will visit engineers, architects and distributors in these territories.



An international party of 25 traffic experts attending a London course, sponsored by the British Council and the Ministry of Transport, recently toured the Hyde Park Improvement Scheme. They inspected the Cubitts Fitzpatrick Shand Information Centre where **Mr. G. N. Dennis**, the L.C.C.'s resident engineer, is seen here explaining details of the £51 million scheme. The party was escorted by **Mr. D. E. Dyas**, of the Ministry of Transport

THE CHICAGO PLAN

For Separate Bids for Mechanical Speciality Contracting

This plan, referred to in our leading article this week, has been drawn up by the Co-ordinating Committee of the Mechanical Speciality Contractors Association of Chicago. Copies of the plan can be obtained price 25c plus postage from this Co-ordinating Committee at Builders Building, Room 1612, 228 N. La Salle Street, Chicago 1, Illinois, U.S.A. This plan is of such significance with regard to the controversy about "all-in" bids that a summary of it is reproduced below.

CONSTRUCTION requires a particular "know-how" which can be acquired only through long experience and extreme specialisation. As a result the industry is composed of numerous autonomous groups each dedicated to a particular activity. This is true especially in the field of mechanical speciality contracting—plumbing, heating, ventilating and electrical. It has been proven that this form of specialisation is thorough, efficient and economical, from the standpoint of both the owner and the industry.

But while all other elements in the industry have kept pace with the growing complexity and cost of the mechanical portions of a building, one element—the system of bidding—has, in far too many instances, remained unchanged. Today with the cost of the mechanical work equal to, or exceeding, that of the structural contract it is no longer logical or defensible for this work to be included in one overall "construction" contract with the general contractor who lets individual "sub-contracts" for the mechanical speciality work.

This system has produced a long chain of undesirable effects, three of which are capable of bringing about a state of complete chaos in the construction industry.

Unreasonable Cost results from the fact that it is deemed necessary and proper for a prime contractor to add a "handling charge" to the cost of each of the sub-contracts which he must negotiate, in addition to a justifiable co-ordinating and supervising fee.

Bid-shopping arises where a main contractor is awarded a single contract embracing both the structural and mechanical portions which places him in a position to auction off the mechanical speciality contracts worth perhaps 50 per cent. of a \$10,000,000 project. Every dollar that is "saved" as a result of this auction accrues solely to the main contractor. Not one nickel of it goes back to the owner.

Bid-peddling arises through a type of mechanical speciality contractor who gambles that he is sharp enough to make a profit by providing inferior workmanship and by substituting inferior materials.

Bid-shopping and bid-peddling have produced a new breed in the industry known

by the descriptive term of "broker-contractor" with the emphasis on the word "broker" being neither builder nor mechanical speciality contractor. He lives not by the just and normal profit resulting from his contribution to the construction of a building but rather from his ability as a shrewd auctioneer. He is interested solely in getting the lowest price without any real concern for past performance, competency or integrity.

The growing impact of the broker-contractor has forced an ever increasing number of reputable general contractors to resort to bid-shopping and has similarly turned more and more mechanical speciality contractors along the path of bid-peddling. The conscientious contractor who does not wish to participate in such unfair trade practices is inclined to withdraw from competitive bidding and to concentrate on negotiated work.

The readily apparent final result is that the construction industry will be left in the hands of a group of ruthless and unscrupulous money-makers and that pride of workmanship, integrity and reputation will become meaningless platitudes.

Case For Separate Bids

Several solutions have been tried including bid-listing whereby the general contractor identifies his sub-contractors in advance and bid-depositories which establish a central location for the handling of mechanical speciality bids. These measures have been ineffectual in the latter case because the system was purely voluntary.

The complete answer is the procedure based on separate bids. Under this system separate specifications are prepared for each of the four categories of mechanical speciality work, namely, plumbing and sewerage; heating piping, refrigeration and automatic temperature control systems; ventilating and distribution systems for conditioned air; and electrical installations. Separate bids for each of these four categories of work are taken from reputable mechanical speciality groups. The bids are submitted directly to the owner or to his architect or consulting engineer so that at no time, prior to the opening date, does any bidder get to see his competitor's bid, and at no time, after the opening, can he offer to reduce his original bid. By the same token, he is not at any time requested to meet the lower bid, real or imaginary of a competitor.

On the basis of extensive experience with this system, it can be stated unequivocally that it produces two highly satisfactory results:—

(1) *Costs have been lowered.* On innumerable projects, under which bids were taken both ways, the cost of separate bids has been lower in virtually every instance.

(2) *Bid-shopping and bid-peddling have been eliminated.* The lowest bidder, if qualified, is awarded a separate contract at the price shown in his bid. He is not obligated to cheapen the job in order to make a legitimate profit.

A further advantage is that separate bids enables the selection of competent mechanical speciality contractors. Where mechanical contracts are awarded by a general contractor the owner abdicates his right to screen the bidders through his architect and the strong influence of price upon the general contractor often works to the owner's ultimate disadvantage.

When "separate contracts" are let, it is in many cases highly desirable that the administration, supervision and co-ordination of each should be provided by the owner, the architect or the consulting engineer. In some instances, however, it may be preferable to place all co-ordination and supervision under the general contractor. In these cases, it is recommended that, after mechanical contracts have been awarded they should be assigned to the general contractor and where this is contemplated the original specification and bid form should provide for a supervision-co-ordination fee. In addition, as a further incentive to established solvent general contractors the assignment of contracts should by all means include a provision for payments to be made directly to all mechanical contractors to discourage the practice of general contractors in financial distress of delaying due payments in order to finance their own operations.

Many other groups and individuals recognise the need for separate bids. A survey among architects in Chicago conducted in 1958 showed that 71 per cent. of the 48 per cent. who returned the questionnaires favoured separate bids. Many general contractors individually if not collectively have come to realise that there is a great deal of merit in bid separation—from the standpoint of the general contractor.

CEMENT PRICE FIXING RESTRICTIONS

Not Contrary to Public Interest, Says Court

THE Restrictive Practices Court has declared that the general price fixing restrictions in the agreement between the members of the Cement Makers Federation are not contrary to the public interest but that restrictions relating to deferred rebates to large users and the restriction prohibiting members from entering into contracts of more than 12 months' duration other than for a specific job are contrary to the public interest.

MR. JUSTICE DIPLOCK, in the course of reading the judgment of the Court said that the Court was satisfied that the federation, following the advice of the independent costs committee, had been content to fix their prices at a low level, despite their

having collectively a monopoly of the trade and the almost continuous existence of a sellers' market, and that they did this because of the greater security of their investment afforded by the price agreement. The federation had, accordingly, proved that the scheme conferred a specific and substantial benefit on the public.

Unjustified Rebates

The other restrictions embracing common marketing arrangements were justifiable as being reasonably required for the maintenance of the price scheme. The only exceptions were the deferred rebates given to large users, which were based on the aggregate purchases in a year by a

customer from all the members. Rebates had an economic justification only if they produced a saving in production costs, but the deferred rebates did not possess that characteristic. There had been no attempt to defend the restriction which required members not to enter into contracts of more than 12 months' duration, other than for a specific job. Accordingly, these two restrictions would be declared contrary to the public interest.

The Court had been influenced in its decision in favour of the price scheme by the fact that the members had fixed the prices with moderation and a sense of responsibility. If there was to be any departure from the principles on which they had acted or in their profit margins, that would be a material charge of the relevant circumstances entitling the registrar to reapply the Court to reconsider its decision.

£6½M. BUILDING CONTRACTS

ANNOUNCED

New Office — Hospital — N.A.T.O. Depot

A NEW £2½ million head office is to be built for Pilkington Bros., Ltd., St. Helens, Lancs., by Holland & Hannen and Cubitts (North West), Ltd. Construction is due to commence next month and is scheduled for completion in the autumn of 1963.

The group of buildings, arranged round a lake, will be dominated by a 170ft. tower block and will include a museum. Two of the main features will be floor to ceiling windows in the office blocks and blue-toned Armourclay glass cladding of the tower block.

The canteen building planned at the same time is due to be completed in September of this year. It will serve the head offices of Pilkington Bros., Ltd., and Fibreglass, Ltd., and their works in the Ravenhead area.

Architect for the whole scheme is Mr. E. Maxwell Fry, C.B.E., F.R.I.B.A., of Fry, Drew and Partners, London, and Mr. P. Bond, A.R.I.B.A., is the architect in charge. Cubitts (North West) are also in the final stages of building Pilkington Bros.' new £2 million research laboratories at Lathom, Lancs., which will be the largest glass research centre in the world.

£2M. Cumberland Hospital

Work will start on April 10 on the erection of the main stage of a new hospital at Hensingham, near Whitehaven, Cumberland.

At a recent special area meeting of the committee for Cumberland and North Westmorland of the Newcastle Regional Hospital Board the £1,955,131 tender of John Laing and Co., Ltd., Carlisle, was accepted for the work. This stage, which will take about 3½ years, will provide 350 beds and will virtually complete the hospital.

N.A.T.O. Storage Depot

The Admiralty has awarded the main contract for the construction of a N.A.T.O. storage depot at Glen Douglas, Scotland, to John Howard and Co., Ltd., London. It is expected that the work will take about three years to complete and will cost between £2 and £3 million.

FIRE OFFICER ADDRESSES SAFETY MEETING

A talk on the provisions relating to fire precautions under the Factories Act, 1959, was given by Mr. R. E. S. Whillock, Assistant Divisional Officer with the London Fire Brigade, at a recent meeting of the London Building and Engineering Contractors Accident Prevention Group.

Mr. Whillock discussed aspects of the fire regulations in buildings, and outlined many of the hazards encountered by the Fire Brigade, particularly in converted dwellings operating as workshops and factories.

L.M.B.A. PRESIDENT COMMENTS ON "TAKING CONTROL"

SPEAKING this week at a North Western Area meeting, Mr. R. F. Mansell, president of the London Master Builders Association, said:

"I cannot let any review of the activities of the Association pass without commenting upon the recently achieved wages settlement. It has received such differing epithets as statesmanlike and stupid, far sighted and futile, but one thing stands out clearly. It is this. In October 1961 we employers shall have presented to us a chance, the like of which we have not had for 30 years, to take control of our industry. To exert leadership, to indicate to our operatives that while we work happily with them, ours is the responsibility, and the risk, and the duty of running our own businesses.

"I think that I can say, without fear of contradiction, that if we let this chance go it is unlikely to come our way again in the working life of most of us. It can only be seized and made the fullest use of if the building industry is prepared to be loyal to itself. In these days of shortages of labour, above all of skilled craftsmen, it is going to be a great temptation to offer paid refreshment breaks.

"The National Joint Council has made its views quite clear on this subject, and I must ask you all, not only those of you here, but your members throughout the Area, throughout London, and the Country, to set an example of that loyalty to each other, to the industry, and to your trade association.

"My predecessor wondered, in his final address, whether the era of the great captains of industry was over. I can only say to you that if you now want to once again be masters in your own house, you must not fall prey to the temptations which will beset you."

(Concluded from page 1558)

2,000 tons, that a most useful application of the system has not received the attention deserved. This is the installation of a series of these large piles—or more correctly cylinder foundations—adjacent to each other to act as a retaining wall.

The use of bored concrete piles to retain a muck face whilst a reinforced concrete retaining wall is constructed is not a new idea, for it has been used several times in the past. However, the size generally used to date (17in. or 18in. diameter), whilst it has the advantage over steel sheet piling of silent installation and relative non-disturbance of the ground, has but a limited bending strength. Consequently a wall of bored piles has required a series of timber, steel, or concrete walings and struts. The disadvantage of excavating between raking struts, or alternatively the need for excavating first a girdle trench sheeted on both sides and later removing the dumphing, has remained, and also that of re-strutting the excavation from the completed retaining wall.

When concrete cylinders, 30in. or 36in. in diameter, are placed shoulder to shoulder to form a continuous wall the bending strength is such that a vertical muck face 25ft. in height can be safely stabilised.

Construction of the cylinders is carried out by normal methods of mechanical auger or shell-auger to the depth required. The usual procedure is for alternate cylinders to be concreted leaving spaces equal to the cylinder diameter or about 6in. over. A second machine then follows the first, placing cylinders in the gaps to complete the wall. Where the spacing is closed up cylinders are staggered in plan to overcome possible obstructions from irregularities in the concrete cylinders already completed.

Where ground is non-cohesive or water-bearing, the first cylinders are filled with ballast rejects or similar material and a grout tube is inserted. They are then grouted from the bottom whilst the grout

tube is withdrawn after the alternate cylinders have been concreted. By this means, a curtain wall can be put down to considerable depths through water-bearing rock to seal off excavations that would defeat normal methods of sheet piling.

Cylinders are taken down to a depth below the formation level of the future excavation such that they are stable and they are suitably reinforced to resist the bending moments arising from the ground pressure. The excavation in front of the wall can then be carried out expeditiously by mechanical plant, at bulk excavation rates, and the need for sheeting, strutting, excavation and concreting in trenches, and re-strutting the muck face from the completed wall, is obviated.

The provision of a sufficient area of reinforcement in the cylinders, and its maintenance in the correct position during concreting, is a problem, but the compaction of the concrete is found to require no special precautions. The face of the completed cylinder is exposed on excavation and experience has shown that normally no segregation or honey-combing is produced even though the concrete is placed without the use of tremie pipes, bottom opening skips or other special equipment. Cylinder retaining walls are designed from a knowledge of the sub-soil characteristics just as they are when used as foundation piers, and an adequate factor of safety is given against failure. Some calculation must also be made of the deflection of the wall, figures of ¼in. to 1in. at the top being expected with a 25ft.-30ft. exposed height.

In clay sub-soils the fact that the wall is constructed against the muck face without allowing significant movement has the advantage of keeping the muck impermeable and eliminates the need for a waterproof membrane.

The cylinder wall, when exposed, is generally cleaned down and the muck between the piles removed so that a mechanical key is formed for bonding on the facing. This should make allowance for variations in the cylinder construction,

but a thickness of 9in. containing a mesh of reinforcing bars has been found suitable. The main pressure from the ground is permanently resisted by the cylinder wall and consequently, provided that the initial deflection is acceptable, there is no further problem caused when the pressure is transferred to a conventional retaining wall.

The ability to carry out the excavation for the basement of a building in one stage speeds up a contract by several weeks, and in the work so far carried out it has offered considerable economies.

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Trade and Company News**B.M.C. INTRODUCE AUSTIN 250 INDUSTRIAL GAS TURBINE**

PRODUCTION of the Austin 250 industrial gas turbine—the result of twelve years secret development—was announced this week by the British Motor Corporation.

The turbine, which in its basic form measures only 37in. long, 35in. wide and 51in. high, runs on gas oil or Derv, but is also suitable for conversion to operate on other distillate or gaseous types of fuel. Air is drawn into a centrifugal compressor where it is compressed at a ratio of 3.5:1 and flows into the single combustion chamber. Here the compressed air is heated and greatly increased in volume by the introduction and burning of finely atomised fuel—a process which takes place with minimum loss of pressure.

The resultant high temperature gases are then directed from the combustion chamber, rapidly expanding through the two-stage turbine to the atmospheric pressure at the exhaust exit. Being directly coupled on the single shaft rotor, the turbine drives the compressor thereby completing the simple open cycle.

Power is taken from the turbine rotor through a reduction gearbox to the final drive shaft and the driven machine.

Cooling air is directed from the compressor to the turbine discs and blades keeping them at a much lower temperature than that of the hot exhaust gases passing over them, so avoiding damage from excessive thermal stresses.

Automatic devices are fitted to protect the unit from overspeed, excessive gas temperature, and loss of lubricating oil pressure.

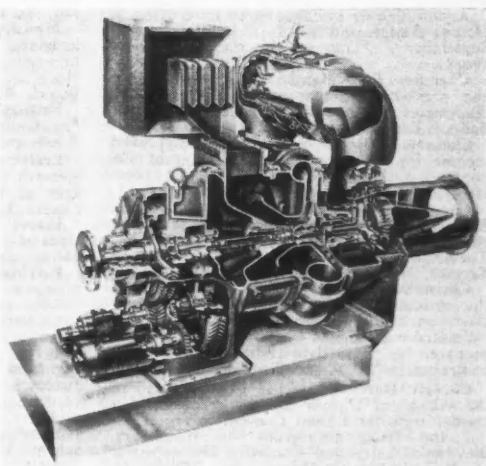
Compressor

The single-stage centrifugal compressor gives a pressure ratio of 3.5:1. The impeller and separate guide vanes are machined from forgings of RR.58, a high-tensile aluminium alloy, and are shrunk

onto the steel shaft. A diffuser of aerofoil vanes is used, and the compressor casing is constructed of well-ribbed aluminium castings.

Turbine

The turbine is of axial-flow type, of two stages. The nozzles are precision cast in HR Crown Max, whilst the rotor blades



Cut-away diagram of the turbine

and discs in both stages are machined from Nimonic 90 forgings.

Bearings

The rotor is carried on two bearings, one ball and one roller, with oil jet lubrication.

Fuel System and Combustion Chamber

These are supplied by Joseph Lucas, Ltd. A single combustion chamber is used, with side entry, having a Nimonic 75 flame tube in an aluminised mild steel outer casing. Fuel is supplied through a Simplex atomiser from a piston-type fuel pump incorporating a governor control to maintain the required running speed.

In applications which demand operation

over a range of speeds an adjustable governor is fitted which can be operated by cable or rod control.

Starting

Starting is automatic, initiated by push-button. The unit is driven up to light-up speed by a 24-V D.C. motor mounted on the gearbox driving through a sprag-type clutch; admission of fuel, ignition, switching off the starter, and control of acceleration are effected by relays and solenoids.

Reduction Gear

Speed reduction from the rotor speed of 29,000 r.p.m. to the output shaft speed of (normally) 1,500 r.p.m. is carried out through two simple pairs of double-helical gears, which are of nickel-chrome steel case-hardened and ground to give long life. Further spur gears driven from the layshaft provide auxiliary drives. Ball and roller bearings are used throughout the gearbox. The drive from the turbine rotor to the input gear is taken through a floating splined shaft.

Separate oil feeds are taken to all high-speed bearings and also to oil jets on the main gears.

Lubricating Oil System

The lubricating oil, a straight mineral oil of SAE 10W grade, is contained in a fabricated steel tank of 20 gallons capacity which also forms a bed on which the engine and gearbox are mounted. A double Hobourn-Eaton rotor pump serves two separate oil circuits from the oil tank, one to feed oil under pressure to all the bearings and gears, through a full-flow filter, and the other to circulate oil through a cooler, which will normally be cooled by water but may be cooled by air from a fan if water is not available.

Air Intake

An intake air silencer with simple air filters will usually be mounted on the compressor air intake flange. If the surroundings are dusty, necessitating more extensive cleaning arrangements, ducting will be arranged as required.

Instruments and Protective Devices

The instrument panel carries a tachometer, maximum gas temperature indicator, fuel and lubricating oil pressure gauges, engine hours meter, and the starting button.

Automatic devices are fitted to protect the unit against over-speed, excessive gas temperature, or loss of lubricating oil pressure.

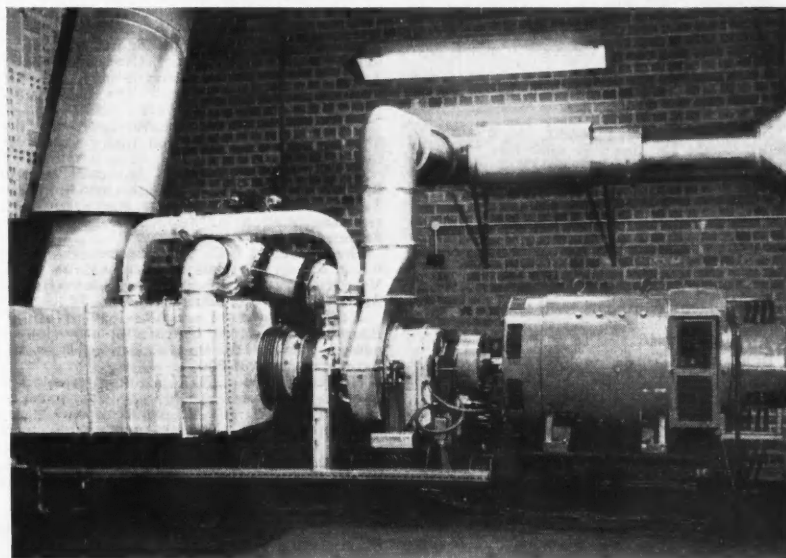
Mounting

Complete generating or pumping sets are mounted on a fabricated frame into which the combined oil tank and bed of the power unit fits and which is extended to carry the generator or pump. A light frame bridging the generator or pump carries a 50-gallon sheet steel fuel tank, allowing 1½ hours full load running on one filling.

Three Forms

Initially the turbine will be available in three forms all without heat exchangers: (1) Coupled to a 160-kW alternator for electric power generation; (2) coupled to a centrifugal water pump; (3) as a separate power unit for driving almost any kind of industrial plant.

At the same time, however, it is considered to be a major step forward towards the final production of a vehicle turbine and B.M.C. are now undertaking further research which, it is anticipated, will culminate in the development of a 250-h.p. vehicle gas turbine for high-speed heavy commercial vehicles and other forms of transport.



An experimental turbine installation showing the Austin 250 fitted with a heat exchanger (left) driving an electrical generator. This heat exchanger unit is still under development and is not yet available on a commercial basis

● Trade and Company News continues on page 1588. Subsequent articles include New Orders for Construction Work in the Fourth Quarter of 1961 (p. 1591), Talking of Safety, by "Dragee" (p. 1592), Eastern Region Railway Modernisation at Colchester (p. 1593), and Modernisation of Trinidad's General Hospital (p. 1596).

Current Construction Activities

PROJECTS

CONTRACTS

AWARDS

THIS editorial feature provides readers with a comprehensive news service covering forthcoming private and public construction work. Commencing on this page information is given concerning future projects followed by details of tenders being invited. In the third section will be found news of tenders recommended for acceptance, tenders accepted and contracts awarded. Attention is also drawn to the advertisements covering contracts and appointments appearing in the front part of the *Journal*.

BUILDING AND DECORATING (See also Housing Schemes)

Aldershot, Hants.—Co. E.C. preparing bills of quantities for the erection of the three-form entry Heron Wood County Secondary School.

Alton, Hants.—Co. E.C. preparing working drawing and specifications for the main dental clinic at Alton Secondary School.

Andover, Hants.—C.C. preparing working drawings and bills of quantities for the erection of a fire station.

Basingstoke, Hants.—C.C. have approved scheme for installation of oil-fired heating equipment at the Queen Mary Grammar School, estimated cost £1,414; erection of a court house and offices for the justices' clerk and probation officers, £63,750; bills of quantities are being prepared for the extension to the girls' county high school and preliminary sketch plans for extensions (phase II) to Queen Mary's Boys' School.

Batley, Yorks.—Borough Engineer has been instructed to prepare plans for the erection of shops and three-bedroom maisonnettes in Upper Commercial Street.

Berwick, Northumb.—Jus-Rol, Ltd., are to extend their factory on the Tweedside trading estate, and the scheme is being considered by the planning authorities.

Billingham-on-Tees, Dur.—Imperial Chemical Industries, Ltd., propose further developments at their Billingham Works, including the erection of new administrative buildings.

Bishop Auckland, Dur.—Hammond United Breweries, Ltd., Bradford, are to erect a public house at Douthwaite Road, M. C. Robson and Son, architects, Station Chambers.

Bishop Auckland, Dur.—William Leech, Ltd., St. James Street, Newcastle upon Tyne, are seeking the approval of the planning authorities for the erection of houses for key workers employed by Westool, Ltd., engineers, Bishop Auckland. The planning authorities, it is understood, are willing to approve the development of a site of 21 acres for this purpose.

Blackburn, Lancs.—B.C. recommended to apply for sanction to borrow £36,037 and £8,000, respectively, for extensions to Belper Street Baths and Shadsworth Secondary School; approve the erection of public conveniences at Corporation Park, estimated cost £4,064, and at Mill Hill Gardens and Whalley Banks, £5,500.

Blofield and Flegg, Norfolk.—R.D.C. have approved scheme for improving and repairing 111 pre-war dwellings. Estimated cost £29,453.

Blyth, Northumb.—William Leech, Ltd., 7 St. James' Street, Newcastle upon Tyne are to build shops and flats on Tynedale Drive Estate; Plans have been approved for three shops and two flats, Wordsworth Avenue, for S. McCullough, Ltd., 46 High West Street, Gateshead.

Blyth, Northumb.—Borough Engineer has prepared a £10,000 scheme for the construction of a roller skating rink.

Bootle, Lancs.—Health Committee have approved plans for an extension at the Health Centre in Knowsley Road.

Bradford, Yorks.—City Council recommended to approve for inclusion in the 1961-62 programme, schemes for provision of an additional classroom at Buttershaw Junior School, estimated cost £4,500; reorganisation of Wyke Junior School, £19,900; construction of additional classrooms at Rosemount Institute of Technology, £15,000; appoint J. G. L. Poulson, 29 Rongate, Pontefract, to undertake architectural, structural and mechanical engineering and quantity surveying work for the erection of Tong Secondary School.

Bury St. Edmunds, Suffolk.—Licensing Magistrates have granted a provisional licence for the erection of the Minden Rose public-house at Newmarket Road industrial estate for Greene, King and Sons, Ltd., Westgate Brewery.

Carlisle, Cumb.—Ministry have approved sketch plans for casualty department at Cumberland Infirmary for Newcastle Regional Hospital Board. P. H. Knighton, chief architect.

A new Crown building is to be erected at George Street, and work is due to start in September. Plans are by the Ministry of Works.

Chandlers Ford, Hants.—C.C. have approved the provision of two additional temporary classrooms at Chandlers Ford County Junior School. Estimated cost £3,250.

Chatham, Kent.—B.C. have approved scheme for the external redecoration of 636 houses during 1961-62. Estimated cost £10,577.

Chester-le-Street, Dur.—Crossley and Sons, Borough Road, Middlesbrough propose offices, showroom, depot at Durham Road, Birley. The architects are Child and Hall, 6 Archbold Terrace, Newcastle upon Tyne.

Christchurch, Hants.—C.C. have approved the provision of four additional temporary classrooms at Somerford County Junior School, estimated cost £6,500; working drawings being prepared for phase II of additional classrooms at Bransgore C.E. (Controlled) Primary School.

Consett, Dur.—A site has been selected in the village of Dipton for the erection of a crematorium for a Joint Committee representing the local authorities of Whickham, Blaydon, Stanley and Consett. The approval of the planning authorities has still to be obtained.

The Rank Organisation, Ltd., 11 Belgrave Road, London, S.W.1, propose the adaptation of the Gaumont Cinema, Watling Street, into a bowling alley.

Corby, Northants.—U.D.C. have approved proposals for a 110ft. long and 42ft. wide swimming bath.

C.C. recommended to approve, subject to Home Office approval, the provision of basement for civil defence purposes in the Civic Centre, estimated cost £11,300; approve, subject to M.E. approval extension to three-form entry, Samuel Lloyd Secondary Modern School, £78,550.

Croydon, Surrey.—B.C. have approved the provision of a new kitchen block at Benson Primary School, Shirley.

Darlington, Dur.—Plans have been approved for a warehouse at Aycliffe for Thameside Properties, Ltd. Elliott Cox and Partners, architects, 172 Buckingham Palace Road, London, S.W.1.

Daventry, Northants.—C.C. recommended to approve, subject to Home Office approval, the provision of basement for civil defence purposes in the Municipal Offices. Estimated cost £11,300.

Owley, Salop.—U.D.C. have approved scheme of improvements at the Town Hall. Estimated cost £7,000.

Dentford, L.C.C. planning permission is being sought for 10-storey offices and flats at 207-241 New Cross Road and 1-13 Nettleton Road, for which the architects are Stock, Page and Stock, 3 Fanshawe Street, London, N.1.

Derby.—Sheffield Regional Hospital Board recommended to appoint T. H. Thorpe and Partners 41 Friar Gate, Derby, architects for modernisation of Ashover and Winsler wards at Kingsway Hospital.

Desborough, Northants.—U.D.C. to invite tenders for the external painting of 44 houses at Alexandra Road and 16 at Peaslands.

Doncaster, Yorks.—Sheffield Regional Hospital Board recommended to appoint Mercer and Miller, 30-32 London Road, Sheffield, 1, quantity surveyors for additional accommodation at Tickhill Road Hospital.

Doncaster, Yorks.—B.C. recommended to invite tenders from selected contractors for the erection of a pavilion at Elmfield Park; approve, for submission to M.E., revised sketch plans for the Technical College, phase IV; prepare, for submission to M.E., sketch plans for improvements at Balby Secondary School; apply for sanction to borrow £469,375 for the construction of basement, first and second floors of the Town Hall.

Durham.—Simpson Lawson and Partners, Emerson Chambers, Blackett Street, Newcastle upon Tyne, have been appointed architects for C. of E. Primary School at Ebchester for the C.C.

Durham.—Funds are being raised for a £120,000 extension scheme at St. Chad's College. Among other things, the work will include new domestic quarters, dining hall, and 20 bedrooms for students. Francis Johnson architect, 16 High Street, Bridlington, Yorkshire.

Ministry have approved sketch plans and estimates amounting to £52,000, for the erection of a pre-discharge ward at Dryburn Hospital, Durham, for Newcastle Hospital Board. P. H. Knighton, chief architect.

Easington, Dur.—Plans are being prepared for Church at Church Lane, Murton, A. Rossi, architect, 88 Medomsley Road, Consett.

Eccles, Lancs.—B.C. recommended to approve the erection of 36 prefabricated garages at Ellesmere Park, 47 at Brookhouse estate, and 22 at Mather Road.

Eston, Yorks.—North Riding C.C. to consider shortly tenders for the erection of an old people's home.

Fareham, Hants.—C.C. have approved the provision of two additional classrooms at the county secondary girls' school and the first instalment of the Park County Infants' School, estimated cost £3,250 and £20,000 respectively; bills of quantities being prepared for the two-form entry Portchester Northern County Junior School and working drawings and bills of quantities for the erection of a fire station at Portchester.

Farnborough, Hants.—C.C. have approved scheme for the conversion of kitchen to classroom and partitioning of dining room to form library and staff room at the grammar school and alterations to provide kitchen, etc., at St. Peter's C.E. (Aided) School, estimated cost £2,150 and £3,868 respectively; sketch plans prepared for adaptations at Crossways Library.

Fellin, Dur.—J. H. Fisher and Co. (Newcastle), Ltd., 12 Lansdowne Terrace, Gosforth, Northumberland, are seeking permission to erect a public house, shops and houses at Davidson Road, Bill Quay; John T. Bell and Son, Ltd., Market Street, Newcastle upon Tyne are planning shopping developments at the junction of Crowhall Lane and Coldwell Street; Outline plans have been approved by the local authority; A site is being considered on the Leam Lane Estate for the proposed erection of a workmen's club.

Feltham, Middx.—Co. E.C. recommended to approve the first instalment of extensions at St. Lawrence's R.C. School, for the school Managers. Estimated cost £33,930.

Finchley, Middx.—Co. E.C. recommended to approve the completion of a pavilion on the playing field at Finchley Grammar School. Estimated cost £10,450.

Gateshead, Dur.—John T. Bell and Sons, developers, Market Street, Newcastle upon Tyne, are seeking permission to erect £750,000 hotel near Bewick Road. The building is expected to be seven storeys high.

Gloucestershire.—E.C. have approved the provision of an infants' and junior school at Gotherington.

Gosforth, Northumb.—Anthony Forrest Partnership, Middleton House, Middleton-in-Teesdale, are the architects for petrol and servicing station at Jubilee Road for the Regent Oil Co.

Greenwich.—L.C.C. planning permission is being sought for flats and garages at Hyde Vale Nursery, for which the architect is Julian Sofer, 1 Montagu Square, London, W.1.

Halifax, Yorks.—Leeds Regional Hospital Board have approved scheme for provision of new pathological facilities at General Hospital. Estimated cost £35,200.

Hammersmith.—L.C.C. planning permission is being sought for a comprehensive development at King Street, Blacks Road and Hammersmith Bridge Road, Angel Walk and Queen Caroline Street, to include 22 shop units, 2 apartment stores, 2 public houses and an 18-storey office block. The architects are Shingler and Risdon, 47 Bedford Row, London, W.C.1.

Hamshire.—E.C. have prepared sketch plan for a women's hostel at Sparsholt Farm Institute.

Hamstead.—L.C.C. planning permission is being sought for shops, flats and petrol station and re-erection of station booking office at

West Hampstead Station site, West End Lane, N.W.6, for which the architect is Ivor Shaw, 57 Blandford Street, London, W.1.

Hampstead.—B.C. recommended to approve provision of site services and carrying out of exterior works at the civic centre site, Swiss Cottage. Estimated cost £60,000.

B.C. recommended to appoint Sciesen, Varming and Mulcahy, 146 New Cavendish Street, London, W.1, as services consultants for Swiss Cottage library scheme, on which work is expected to start during 1961-62.

Harrow. **Middx.**—B.C. recommended to approve sketch plans and appoint Brandon-Jones Ashton and Broadbent, 2 Redington Road, Hampstead, London, N.W.3, as architects for the Civic Centre scheme at Poes's Corner Wealdstone.

Hartlepool. **Dur.**—E. M. Lawson, Barras Buildings, Barras Bridge, Newcastle upon Tyne, is the architect for hotel at Maple Avenue for J. W. Cameron and Co., Ltd., Lion Brewery, West Hartlepool.

Hastings. **Sussex.**—B.C. recommended to invite alternative tenders for the provision of traditional or prefabricated garages at the following: 12 at Tedder Terrace, estimated cost £2,875.54 at rear of 160-202 Red Lake Road, £14,950, 23 between Beaufort Road and Beaufort Crescent, £7,525, and eight standard size and two, small at Blackman Avenue; apply for sanction to borrow £5,000 for the construction of 20 chalets at Victoria Bathing Station.

Havant. **Hants.**—C.C. have approved the provision of two additional temporary classrooms at Front Lawn County Junior School, estimated cost £3,250; sketch plans for a health clinic and ambulance station with staff accommodation at Dunsbury Way, Leigh Park, £61,650; bills of quantities are being prepared for the erection of the Leigh Park Day E.S.N. School, additional classrooms at Bramley C.E. (Controlled) Primary School, assembly hall etc., at Worthing County Primary School and sanitary accommodation at Monk Sherborne County Primary School and working drawings for extensions to Oak Park Boys' and Oak Park Girls' Schools.

Herefordwest. **Pembs.**—C.C. have approved in principle 5 year scheme for the provision of new accommodation at the County Offices. Estimated cost £105,000.

Heston and Isleworth. **Middx.**—Co. E.C. recommended to approve first instalment of extensions at St. Mary's R.C. School, for the school Managers.

Holyhead. **Anglesey.**—M.E. have approved scheme for extensions at Holyhead Comprehensive Secondary School during 1961-62. Estimated cost £80,000.

Hornsey. **Middx.**—B.C. recommended to approve the erection of a prefabricated concrete tool and truck store adjoining existing park stores at the Priory Park.

B.C. recommended to approve provision of an external iron fire escape staircase and pram shelter at Stonecroft Day Nursery, 100 Priory Road, for C.C.

Huddersfield. **Yorks.**—Ministry have approved sketch plans, working drawings and bills of quantities for phase 2 of the new general hospital at Green Lea, Lindley, for Leeds Regional Hospital Board. Architects for the scheme are George, Trew and Dunn, 50 Eastbourne Terrace, London, W.2.

Isle of Ely.—Standing Joint Committee to prepare sketch plans for police headquarters at City Road, March.

Isleworth. **Middx.**—Co.E.C. recommended to approve the provision of a new dining hall, and servery and the re-organisation of the existing kitchen at the Isleworth Polytechnic (St. John's Annex). Estimated cost £15,420.

Islington.—B.C. recommended to appoint V. Fletcher Russell, F.R.I.B.A., Roding House, Abridge, Essex, as the consultant for repairs to the boundary wall at Manchester Mansions. Estimated cost £1,000.

Kensington.—L.C.C. planning permission is being sought for the following: A service tower, 160ft. high, at Cromwell Road, McLeod's Mews and Lexham Gardens, for B.E.A. (Sir John Burnet, Tait and Partners, architects, 10 Bedford Square, London, W.C.1.); shops, offices, service garage, motor showrooms, garage workshops and a 13-storey block of flats at Gloucester Road Station, for which the architects are Ronald Ward and Partners, 29 Chesham Place, London, S.W.1.

Kent.—T. P. Bennett and Son, 43 Bloomsbury Square, London, W.C.1. are the architects for the erection of a port operations building on top of Garrison Point Fort overlooking the approach channel to the River Medway for the Medway Conservators.

Kettering. **Northants.**—C.C. have submitted to Ministry for approval, preliminary sketch plans for junior and adult training centres at The Lawns; recommended to approve, subject to Home Office approval, the provision of basements for civil defence purposes in the Health Centre, George Street. Estimated cost £11,300.

Lambeth.—L.C.C. planning permission is being sought for a restaurant and living accommodation at 67-69 York Road, for which the architects are Sanderson and Partners, 58 Grafton Way, London, W.1.

Lampeter. **Cards.**—Industrial Estates Management Corporation for Wales have approved the erection of a factory to be occupied by J. E. Cardwell and Co. Ltd., Stockport.

Leeds.—Drawings are still at preliminary stage for the development of a site bounded by Woodhouse Lane, Merriem Street, Wade Lane and Coburg Street for Town Centre Securities, Ltd., Gillinson and Barnett, architects, 8 Queen Street, and Wakeman Trower and Partners, quantity surveyors, St. Paul's House, St. Paul's Street, Leeds, 1. Estimated cost £2m.

Leicester.—Sheffield Regional Hospital Board recommended to appoint Snow and Astill 39 Newarke Street, land surveyors for development at Royal Infirmary and Pick, Everard, Key and Gimson 6 Millstone Lane, architects for modernisation of ward 5 and ward 5 dormitory at The Towers Hospital Humberstone.

Lewisham.—L.C.C. approved a scheme for improvements and adaptations at Adamsrill Primary School. Estimated cost £19,630.

Lewisham.—L.C.C. approved improvements to Forest Hill School. Estimated cost £22,880.

Llandudno. **Caerns.**—U.D.C. have approved plans for the erection of a school meals kitchen at Bodafon Road School, for Co.E.C.

Longbenton. **Northumb.**—Owen Pugh and Co., Ltd., Evesham Avenue, Whitley Bay, are to erect office block at Dudley.

Work is expected to start in the autumn on the construction of a Presbyterian Church at Brunswick Road, Wideopen, for the North Tyne Presbytery. Tasker and Partners, architects, 25 New Bridge Street, Newcastle upon Tyne, Estimated cost £19,000.

Luton. **Beds.**—Local Planning Authority have approved B.C.'s proposal to erect a new civil defence control centre, headquarters and garage on land south of New Street and scheme for accommodation works at Chalney Secondary School.

B.C. recommended to invite tenders from selected contractors for the provision of balustrading, spiral staircase and ancillary ironmongery for the new Central Library; proceed with the preparation of plans for the provision of an old peoples' home at Leagrave; lay-out of land at Lea Road and Manor Road as a light industrial area.

B.C. recommended to approve, subject to conditions plans for the erection of motor auction hall, construction of car park and offices with 2 flats over at Belper Road, Dunstable Road junction, for Luton Auto Sales, Ltd., 645 Dunstable Road, Luton.

Middlesbrough. **Yorks.**—E.C. approved final plans for additions to Langhaugh Secondary School, to cost £50,000. J. G. L. Poulson, 54 Albers Road, has prepared sketch plans for additions to the St. Pius X.R.C. Primary School.

Mildenhall. **Suffolk.**—R.D.C. have approved the improvement of 136 pre-war houses in the district. Estimated cost £60,000.

R.D.C. to invite tenders for the painting of 160 houses and the public conveniences at Brandon.

Morley. **Yorks.**—B.C. recommended to invite tenders for the external repainting of 465 houses during 1961-62.

Narberth. **Pembs.**—Home Office have approved scheme for the erection of a new fire station at Springs Gardens for County Fire Services Committee. Estimated cost £18,000.

Nelson. **Lancs.**—Work to commence in the autumn on the erection of a new hotel, to be known as the Walton Arms at Walton Lane, for Massey's Burnley Brewery, Ltd., Bridge End, Burnley.

Newbury. **Berks.**—C.C. have approved scheme for extensions and adaptations at Shaw House Secondary Modern School. Estimated cost £191,430.

B.C. have approved scheme for repairs to the swimming pool. Estimated cost £1,700.

Newcastle upon Tyne.—Quantities are being prepared for the construction of a large boiler-house and laundry at General Hospital, for Regional Hospital Board, Cackett, Burns Dick and MacKellar, architects 21 Ellison Place, Newcastle upon Tyne.

Newcastle upon Tyne.—Plans are being prepared by Williamson and Partners, 7 St. Mary's Place, Newcastle upon Tyne, for the erection of an office block at 34-48 Gallowgate, for Welbar Developments, Ltd., King Street, London, E.C.2; Newcastle Breweries, Ltd., Haymarket, are to erect public house at Kirkwood Drive, North Kenton, and have prepared their own plans. L. E. Morris, 97 Monkseaton Drive, Whitley Bay, has prepared plans for church hall for the Church of the Venerable Bede, Westgate Road.

Northallerton. **Yorks.**—North Riding C.C. to spend £133,660 on the erection of a new wing at the County Hall.

Northamptonshire.—C.C. recommended to approve in principle the demolition of the police station and adjacent buildings in Angel Street, Northampton and the erection on the site of a county library and block of offices with a basement for civil defence purposes.

Northwich. **Ches.**—U.D.C. have approved revised plan for the redevelopment of the Town Market, to include new market hall and internal and external shopping facilities at Crum Hill. Estimated cost £40,000.

Peterborough.—Joint Education Board recommended to approve in principle and submit to M.E. for approval, preliminary plans prepared by Warwick and Ellis, architects, 43a Priestgate, and S. Dodson and Son, Museum Buildings, Priestgate, respectively, for extensions to Lincoln Road Secondary Boys' School and Walton Secondary Modern School. Estimated cost £70,000 and £90,931, respectively.

Pickering. **Yorks.**—Home Office have approved C.C.'s intention to acquire a site at Pickering for a new police station.

Plymouth. **Devon.**—City Council recommended to prepare scheme for the erection of 21 garages on remaining part of the King Street site; submit to M.E. for approval revised schemes for the provision of a maternity and child welfare and school health and dental clinics at Seven Trees site, estimated cost £18,481 and £13,625, respectively.

City Council recommended to approve plans for the erection of a seamen's block at the Royal Naval Barracks, Saltash Road, Keyham, for the Admiralty, and for the modernisation of barracks at Seaton Barracks, Tavistock Road, Crownhill, for the War Office.

Portsmouth. **Som.**—U.D.C. to proceed with scheme for the erection of a swimming pool in the Battery Grounds.

Prudhoe. **Northumb.**—Ministry have approved sketch plans of the fourth stage of a development scheme at Prudhoe and Monkton Hospital, for Newcastle Regional Hospital Board. P. H. Knighton, chief architect. Estimated cost £250,000.

Raunds. **Northants.**—C.C. recommended to approve, subject to M.E. approval, extension to 2-form entry of the secondary modern school. Estimated cost £74,100.

Reading. **Berks.**—B.C. recommended to invite tenders for the extension of the laundry at Woodlands, estimated cost £4,000, and re-visit tenders for the erection of the Infant Welfare Centre at Norcot.

Ripley. **Derbys.**—U.D.C. to purchase land at Crossley Street as site for the proposed new bus station.

Rochdale. **Lancs.**—B.C. recommended to invite tenders for the erection of the mortuary.

Romsey. **Hants.**—C.C. have approved the first instalment of the Romsey County Junior School and improvements to sanitation and provision of head teacher's room at Wellow County Primary School. Estimated cost £20,000 and £1,950 respectively.

Rotherham. **Yorks.**—Licence granted for the erection of a new public house at the junction of Roughwood Road and Fenton Road for Hammonds United Breweries Ltd., The Brewery, Tadcaster.

Rugby. **War.**—Working Drawings are being prepared for the erection of the new St. George's Church, for the Diocese of Coventry. D. Hinton and Associates, Lloyds Bank Chambers, 85 Regent Street, Leamington Spa, are the architects and Slik and Frazier Ltd., 35 Portland Road, Edgbaston, Birmingham, the quantity surveyors for the scheme. Estimated cost £25,000.

Scarborough. **Yorks.**—North Riding C.C. to enlarge old people's home at The Lodge, Westbourne Road, Scarborough, at a cost of £18,500.

Scarborough. **Yorks.**—G. W. Alderson, 4 Pavilion Terrace, has prepared plans for factory off Cayton Road, Eastfield, for D. H. Greaves, Ltd., Oriol Works: Plans have been prepared for the erection of licensed premises at North Marine Road for Robson's Breweries, Ltd. (The architects are Baker, Clark, Scott and Partners, 7 York Place); Zernys Ltd., 43 King Street, Bridlington, are to erect business premises at Westborough.

Seaton. **Cumb.**—John Twiname Ltd., Brigham, are planning the construction of an hotel at Seaton.

Sheffield.—Regional Hospital Board recommended to appoint Oxley and Bussey, 91 Pinstone Street, architects for extensions to occupational therapy department at Middlewood Hospital.

Shiremoor. **Northumb.**—Newcastle Breweries, Ltd., Haymarket, Newcastle upon Tyne are to erect a new public house at Park Lane, Shiremoor. The architects are Mauchlen, Weightman and Elphick, 12 Saville Row, Newcastle upon Tyne.

Shrewsbury. **Salop.**—Housing Committee have approved layout, and tenders are to be invited in due course for the erection

of a further 182 dwellings and 68 garages at Harlescott Grange estate.

Southgate, Middx.—B.C. recommended to grant planning permission, subject to conditions, for the erection of shops with offices above on site of the Gaumont Cinema, Green Lanes, Palmers Green, for Gaumont Cinema Ltd., c/o Goddard and Smith, 22 King Street, London, S.W.1.

Southport, Lancs.—B.C. recommended to proceed, subject to Ministry approval, with the reconstruction of public conveniences at South Marine Gardens. Estimated cost £2,650.

South Shields, Dur.—Scottish Breweries, Ltd., are to carry out alterations, mainly internal, to the Nook Public House, Harcon. The architects are Arthur and Kirkup, 13 Swinburne Street, Gateshead.

Staines, Middx.—Co.E.C. recommended to approve the provision of an engine-testing room with ancillary services at Ashford County Grammar School. Estimated cost £3,080.

Stockbridge, Hants.—C.C. have approved the remodelling and adaptation of former secondary school premises for use by the county primary school. Estimated cost £9,000.

Stockton-on-Tees, Dur.—Licensing authorities have approved a scheme by John Nimmo and Sons, Castle Eden, for the erection of a public house at Darlington Back Lane to be known as "The Mitre". The architects are Johnson and Willis, Dingley Place, City Road, London, E.C.1. Estimated cost £25,000.

Charles Tennet, Ltd., 74 Church Road, are to erect offices in Hanlon Street; The local authority is considering schemes for rebuilding engineering works for the Quayside Engineering Co. Ltd.; warehouse in Brunswick Street for J. Robinson and Co., Darlington; warehouse, offices and showrooms, Skinner Street for M. Turnbull and Co.; office block etc., Portrack Industrial Estate, for Oxbridge Garage Co.; warehouse and offices, Union Street East for Thompson and Brown Brothers, Ltd.; and garage, showrooms etc., John Street, for the Regent Oil Co. Ltd.

E.C. considering schemes for the remodelling of William Newton School (£42,000 for two form entry and £98,000 for three-form entry); Newham Grange School (£92,000); Richard Hind Junior School (£60,000); and Newtown Infant School (£81,000).

Stockton-on-Tees, Dur.—The licensing magistrates have approved the erection of a new public house at Oxbridge, for Vaux and Associated Breweries, Ltd., The Brewery, Sunderland. The cost will be about £28,000. The architects are Trotter and Miller, 134 High Street, Stockton-on-Tees. Estimated cost £28,000.

Plans have been submitted to the M.E. for the erection of the St. Mary's R.C. Secondary Modern Girls' School, T. A. Crawford, architect, 91 Borough Road, Middlesbrough. Estimated cost £180,000.

Stretford, Lancs.—B.C. recommended to approve for inclusion in the 1961-62 programme scheme for the erection of a community centre at Ripon Road-Chatsworth Road, estimated cost £5,500, and the provision of public conveniences at Chester Road-Warwick Road North and Trafford Park, £5,350 and £2,000, respectively; to invite tenders for the external painting of 905 dwellings.

Sunderland, Dur.—Site works have been completed for a large engineering factory in Hylton Road for Hepworth and Grandage, Ltd., St. John's Works, Bradford, and it is expected that the general building contract will be decided soon. The architects are Newrick and Blackbell, 58 John Street, Sunderland.

Sunderland.—The British Transport Commission are expected to start work this year on the reconstruction of Sunderland Railway Station.

Surbiton, Surrey.—B.C. recommended to invite tenders for the construction of 24 garages on land adjoining the Addison Gardens Allotments. Estimated cost £3,750.

Tottenham, Middx.—Co. E.C. recommended to approve the adaptation of classroom as a science laboratory at Page Green Secondary School. Estimated cost £1,682.

Trowbridge, Wilts.—F. R. Huggins, 1 Belmont, Bath, is the architect, for the erection of an old people's club in Trowbridge Park, (scheme in its very early stages). Estimated cost £4,500.

Tynemouth, Northumb.—Developments are proposed at the North Shields stores of George Swan, Ltd., which will develop the premises into a comprehensive departmental store. The proposals have been approved in principle by the local planning authority. The architects are Mauchlen, Weightman and Elphick, 12 Saville Row, Newcastle upon Tyne.

Up Holland, Lancs.—U.D.C. to apply for sanction to borrow £3,000 for provision of bus shelters in the district.

Wallsend, Northumb.—Office additions are proposed in Station Road for Swan Hunter

and Wigham Richardson, Ltd. Plans are by T. F. Burns and Partners, 3 Ellison Place, Newcastle upon Tyne; H. Wharfe, 27 Ridley Place, Newcastle upon Tyne, is the architect; for permanent club premises at Station Road for the Wallsend Boys' Club; outline plans have been approved for meeting hall at Radnor Gardens, for the Low Willington Farm Tenants' Association.

Walton-on-Thames, Surrey.—Co. Planning Committee have submitted to Ministry, for approval, scheme for re-building Hersham County Junior School on part of land at Pleasant Place.

Washington, Dur.—Plans are being considered for factory extensions for the Washington Chemical Co. The firm have prepared their own plans.

Wednesbury, Staffs.—H. W. Shipley and Foster, Upper Bridge Street, Walsall, are the architects, for the erection of a church hall at Church Street, Moxley for the Parochial Church Council scheme still in planning stage. Estimated cost £7,500.

Wellingborough, Northants.—C.C. recommended to approve, subject to M.E. approval, the erection of a day special school and hostel. Estimated cost £61,920.

Westminster.—L.C.C. planning permission is being sought for the following: a 14-storey hotel building at 80-84 Jermyn Street and 18-20 Duke Street, for which the architect is H. Hubbard Ford, 35 South Audley Street, London, W.1; second stage of development of Royal College of Art on land fronting Kensington Gore and Jays Mews, for which the architect is H. T. Cadbury-Brown, 17 Clarges Street, W.1; office building with flats at Constitutional Club and site, 26 Northumberland Avenue, for which the architect is Ronald Fielding, Aldwych House, Aldwych, W.C.2.

Weston-Super-Mare, Som.—B.C. have approved plans for offices extensions at the Town Hall.

Whitehaven, Cumb.—B.C. have approved in principle the lease of land at Meadow Road, Mirehouse, to the West Cumberland Farmers' Trading Society, Catherine Street for erection of storage building; plans approved for construction of a rotary kiln and ancillary buildings, and a chemical plant for Marchion Products, Ltd., Dock Street, Queens Deck.

B.C. have approved scheme for improving Town Hall office accommodation. Estimated cost £1,500.

Whitley Bay, Northumb.—M. J. Liddell and Sons, 36 Great North Road, Newcastle upon Tyne who are developing the £5,500,000 Whitley Lodge Estate have received sanction to build a public house to serve the estate.

Whitley Bay, Northumb.—J. Surtees, 26 Hastings Avenue, has prepared plans for training and recreation rooms at Front Street, Monkseaton; C.C. are to erect grammar technical school at Valley Gardens.

Wigston, Leics.—County Licensing Justices have granted a provisional licence for a public house to be erected at Gloucester Crescent, for Everards Brewery Ltd., Southgate Street Brewery, Leicester.

Willensden, Middx.—Co. E.C. recommended to approve the adaptation of art school accommodation for extension of library at Willensden Technical College. Estimated cost £5,550.

Winchester, Hants.—C.C. preparing working drawings for extensions to Lankhill E.S.N. School and working drawings and bills of quantities for alterations to existing fire station.

Wood Green, Middx.—Co. E.C. recommended to approve repairs to the boiler house at Bounds Green Secondary School. Estimated cost £1,000.

Wood Green, Middx.—B.C. recommended to grant conditionally planning approval for an extension to existing factory by the erection of a 5-storey building to provide offices, loading bay, storage and engineering shop at Barratts Factory, 1 Mayes Road for Caxton Chocolate Co. Ltd., Hugh V. Sprince, 4 Huggin Hill, London, E.C.4, is the architect.

Woolwich.—L.C.C. to erect 37 prefabricated garages at Greenhithe Close, Avery Hill Estate. Estimated cost £8,940.

Workop, Notts.—Sheffield Regional Hospital Board recommended to appoint Grimwade and Ainsley, Imperial Buildings, Rotherham, quantity surveyors for alterations to gynaecology unit at Victoria Hospital.

Yeovil, Som.—British Legion Club Ltd., propose the erection of new club premises in the grounds of present one at Grove House, Preston Road.

Yeovil, Som.—B.C. propose the erection of new civic offices at Hendford Manor.

DEMOLITION

Accrington, Lancs.—B.C. recommended to proceed with the demolition of existing oil stores and adjacent outbuildings at the transport depot.

Blackpool, Lancs.—Work on demolishing the Palace Buildings and the adjoining County Hotel will commence in November.

Bradford, Yorks.—City Council recommended to proceed with the demolition of 687 Manchester Road.

London.—L.C.C. approved the acquisition, clearance and partial redevelopment of the following sites: Bartholomew Square areas, Finsbury. Estimated cost £435,000; Bolina Road areas, Deptford, £90,000.

ELECTRICAL

Islington.—B.C. recommended to appoint Edward Pearce and Partners, 28 Baker Street, London, W.1, as the consultants for the renewal of the lighting installation at various pre-war housing estates, including Tyndale Mansions and Wakelin House.

Kettering, Northants.—C.C. have approved scheme for the provision of a lift at 20 Headlands. Estimated cost £3,000.

Leicestershire.—Sheffield Regional Hospital Board recommended to appoint P. A. Moore, Fourways, The Square, Kinoulton consulting engineer for electrical services at Mountsorrel Institution, near Loughborough, and Carlton Hayes Hospital, Narborough.

Nottinghamshire.—Ministry of Power has approved plans to build the first of two large coal-fired power stations at West Burton. When complete in 1967 it will be the most powerful steam station in Western Europe, with an installed capacity of 500,000 kilowatts.

Rochdale, Lancs.—B.C. recommended to approve for inclusion in the 1961-62 estimates scheme for the rewiring of Oakenrod School, £2,100.

Southall, Middx.—Co. E.C. recommended to approve, subject to Ministry approval, scheme for improvements to the electric lighting at Dormer Wells Secondary Boy's and Girls' School. Estimated cost £4,294.

Swansea.—B.C. recommended to apply for sanction to borrow £5,335 for a scheme of traffic signals, islands and refuges at the junction of Cwmbach, Cockett and Station roads, near Cockett station.

Twickenham, Middx.—Co. E.C. recommended to approve, subject to Ministry approval, scheme for improvements to the hall lighting at Twickenham Technical College. Estimated cost £2,010.

GAS AND WATER SUPPLY

Bradford, Yorks.—City Council recommended to approve the construction of adjustable weirs on the Stubden Conduit intakes at Paul Clough, Nan Scar and Great Clough. Estimated cost £11,930.

Chipping Norton, Oxon.—R.D.C. have approved, for submission to Ministry for approval and grant aid first phase of a comprehensive water scheme for the rural district. Estimated cost £250,000 total Estimated cost of scheme £714,615.

Freebridge Lynn, Norfolk.—R.D.C. to apply for sanction to borrow £7,136 for extending water mains at East Winch, Leziate and Grimston.

Haverfordwest, Pems.—R.D.C. to apply for sanction to borrow £30,000 for scheme to abstract water from the River Solva to supply St. David's and district. The scheme includes the construction of a 170,000 gallon service reservoir at Glasfryn.

Hereford.—Herefordshire Water Board have approved scheme for screening the second-half of the river intake and fitting the whole intake from the River Wye with a floating boom at Hereford Waterworks. Estimated cost £4,850.

Newport, Salop.—East Shropshire Water Board have approved scheme for boosting the water supply to Edmond, Estimated cost £1,200.

Norwich.—City Council recommended to approve the laying of a water main and construction of a booster station to serve Drayton and Taverham. Estimated cost £11,000.

Rhayader, Radnors.—R.D.C. to submit to Ministry for loan sanction and grant aid scheme for improving the water supply. Estimated cost £29,820.

Stratford-upon-Avon, War.—R.D.C. to invite tenders during May for the provision of an aeration plant at the Heathend Pumping Station.

Up Holland, Lancs.—U.D.C. to apply for sanction to borrow £1,460 for laying of water mains on the estate off Sandbrook Road being developed by James Gaskell and Sons Ltd.

HARBOURS, PIERS AND SEA DEFENCE WORKS

South Shields, Dur.—B.C. to spend £27,700 improving the seaward side of the N.C.B. embankment along the coast road. The work includes renewal of footpaths and kerbs.

Towyn, Merioneths.—U.D.C. to apply for sanction to borrow £35,000 for coast protection scheme.

HEATING AND VENTILATING

Caistor, Lincs.—Sheffield Regional Hospital Board recommended to appoint Myles White and Associates, White Hart Chambers, 16 White Hart Street, Mansfield, architects for remodelling of heating and wiring systems in centre block at Caistor Hospital.

Doncaster, Yorks.—B.C. recommended to approve the installation of oil heating at Hyde Park Secondary School and Intake Secondary School extension; proceed with replacement of defective piping at Technical High School for Girls; prepare scheme for improvements to the heating at Wheatley Hills Secondary School for Boys.

Enfield, Middx.—Co. E.C. recommended to approve conversion of heating system to oil firing at St. George's C.E. Primary School. Estimated cost £1,000.

Finsbury.—L.C.C. approved an estimate of £11,815 for alterations to the heating installation at Northampton College of Advanced Technology.

Goldborne, Lancs.—U.D.C. to apply for sanction to borrow £23,000 for central heating boilers and plant on the Heskeith Meadow housing estate.

Hampshire.—C.C. have approved scheme for converting to oil-firing the heating and hot water plants at the Old People's Homes at Corhampton House, Corhampton, Morton House, Kings Worthy, Fleming House, Eastleigh, and Eastfield House Home for the Blind, Andover. Estimated cost £3,966.

Rochdale, Lancs.—B.C. recommended to approve for inclusion in the 1961-62 estimates heating works at following: Oakenrod School, £1,500; Kirkholt Secondary Modern School, £2,500; Brimrod Nursery School, £1,250; Howard Street Nursery School, £1,250; and St. Patrick's School, £1,460.

HOUSING SCHEMES

Accrington, Lancs.—B.C. recommended to approve in principle, outline scheme for eight aged persons dwellings, a communal centre and warden's accommodation at Milnshaw estate.

Ashton-in-Makerfield, Lancs.—U.D.C. have approved layout for a further 110 houses on the Low Bank Road estate (50 two-bedroom and 40 three-bedroom houses, 10 two-bedroom and 10 one-bedroom bungalows).

Bacup, Lancs.—Borough Engineer to submit details of proposals for erection of further dwellings in Lord Avenue and Haworth Drive, to the Housing Committee.

Barrow-in-Furness, Lancs.—B.C. recommended to approve, subject to conditions and Ministry approval, scheme for 56 semi-detached houses, 11 detached houses, 14 semi-detached bungalows and 81 garages and stores on land north of Dalton Lane (phase 1 development) for John Laing Construction, Ltd., Mill Hill, London, N.W.7.

Bideford, Devon.—F. J. and W. R. Tithecott and Son, 17 Bridgeland Street, Bideford propose the erection of 47 bungalows and 46 houses at Abbotsham Road. Planning approval has been granted.

Bishop Auckland, Dur.—Edwin Pye and Sons, East Parade, are to erect about 60 houses on the Woodhouse Close estate.

Blackburn, Lancs.—B.C. recommended to apply for sanction to borrow £66,721 for eight houses and 36 flats in the Montague Street area housing scheme.

Bolton, Lancs.—B.C. recommended to approve amended layout plan for the provision of one-bedroom bungalows, maisonnettes and two-storey blocks of flats with garages space at Green Way, Hall i'th' Wood.

Bradford, Yorks.—City Council recommended to approve plans for the conversion of Heathroyd, West Drive, Ilkley, into three flats. Estimated cost £5,250.

Carshalton, Surrey.—Co. Town and Country Planning Committee have approved, subject to Ministry approval, scheme for the erection of 26 old people's bungalows with a meeting room and a groundsman's flat above, a shop with warden's flat above and 8 lock-up garages on the site adjoining the River Wandle at River Gardens, for U.D.C.

Cheltenham, Glos.—R.D.C. to prepare scheme for 4 dwellings at Twynning.

Colwyn Bay, Denbighs.—B.C. have approved, for submission to Ministry for approval layout plans for the erection of a two-storey block of four flats and 14 old people's bungalows in Tanylan Road, Old Colwyn and an Eagles Farm (Mochdre) scheme for one house and two old people's bungalows.

Dalton, Lancs.—Ministry have approved the erection of 16 one-bedroom flats in Ainslie Street, for U.D.C.

Doncaster, Yorks.—B.C. recommended to prepare detailed plans for the erection of 14-storey flats with launderette and 9-storey flats in the central area.

Dorking and Horley, Surrey.—Ministry have approved, subject to conditions, scheme for

an estate of 20 units, some houses and other bungalows for elderly people, at the Musicians' Site, Beare Green for inclusion in the 1961 programme, for U.D.C.

Eccles, Lancs.—B.C. recommended to approve scheme for 51 self-contained flats with garage accommodation at 25 and 26 Worsley Road for the Salford Catholic Protection and Rescue Society Incorporated, c/o 31 Princess Street, Manchester, 2; 20 terraced houses between Preston Avenue and Half Edge Lane for W. P. Mitchell (Builders), Ltd., 190 Rochdale Road, Middleton.

Eton, Bucks.—U.D.C. to submit to Ministry for grant aid, scheme for the erection of dwellings comprising phase I of the Eton redevelopment.

Falkirk, Stirlings.—Dean of Guild Court have approved 41 houses at Millburn Street for B.C. Estimated cost £62,300.

Felling, Dur.—U.D.C. to build 24 dwellings for old people.

Freebridge Lynn, Norfolk.—R.D.C. to prepare plans for 10 bungalows at Congham housing site; propose the erection of 5 pairs of bungalows at Chequers Road site, Grimston.

Frome, Som.—U.D.C. recommended to invite Reema Construction Co. Ltd., and Selleck Nicholls and Co., Ltd., to submit outline proposals and the broad cost of developing three or four storey flats on part of the Mount estate, prepare scheme for the erection of 18 aged persons dwellings at Roddenbury Close.

Gateshead, Dur.—The North-Eastern Housing Association, 5 Windsor Terrace, Newcastle upon Tyne are to let contract for the erection of another 212 houses and 60 garages on Leam Lane estate.

Hackney.—B.C. recommended, subject to Ministry sanction, to approve development of the Homerton High Street-Ponsford Street site by erection of 60 flats and 30 garages. Estimated total cost £204,000.

Hedon, Yorks.—County Planning Authority have approved the erection of 34 council houses and 16 old people's bungalows on the Westlands housing estate, for B.C.

Heston and Isleworth, Middx.—B.C. have submitted to Ministry, for approval, scheme for the erection of 32 houses and 36 flats with garages (for sale) on land at junction of Hall Road and Whitton Drive.

Hounslow, Middx.—Co. Area Planning Committee have granted outline preliminary planning approval, subject to Ministry approval, for the erection of four blocks of maisonnettes with garages, and 24 shops with 18 maisonnettes above at Beavers Farm. R. Batstone, 70 Victoria Street, London, S.W.1, is the architect for the scheme.

Ince-in-Makerfield, Lancs.—U.D.C. to apply for sanction to borrow £26,350 for 20 one-bedroom flats to be erected on the Central School housing site.

Islington.—B.C. recommended to appoint E. C. P. Monson, 120 Moorgate, London, E.C.2, as the architects, and Oswald E. Parratt and Partners, Adelaide House, London Bridge, E.C.4, as the quantity surveyors for seven dwellings proposed at 309-313 Liverpool Road.

Kingsclere and Whitechurch, Hants.—R.D.C. to erect, subject to Ministry approval, 4 old people's bungalows each at Kingsclere and Tadley, 2 old people's flats at Whitechurch and 4 houses each at Overton and Tadley.

Lambeth.—B.C. recommended to appoint P. T. Walters and Wheatley, Sicilian House, Sicilian Avenue, London, W.C.1, as the quantity surveyors for housing development at site 46, Binfield Road and South Lambeth Road.

Lewisham.—B.C. recommended to invite tenders for erection of 31 dwellings for elderly persons, a warden's flat and four garages at 5-23 Siddons Road and land adjoining 4 Normanton Street.

Luton, Beds.—B.C. recommended to grant, subject to conditions, planning approval for the erection of 144 houses at Limbury Mead estate, for H. C. Jones Ltd., 183 Hightown Road, Luton; three multi-storey blocks of 105 flats at The Larches, Old Bedford Road, two 7-storey blocks of 46 flats at Oakthorpe, Hart Hill Drive and part of 19 Crescent Road and two 9-storey and 18-storey blocks of 79 flats at Oakthorpe, Hart Hill Drive and adjoining sites, for Walter King Property and Management Co. Ltd., 129 Finsbury Pavement, London, E.C.2.

Malden and Coombe, Surrey.—B.C. to submit to Ministry for approval, scheme for the erection of 24 flats 48 maisonnettes and 11 houses at Sussex Place, New Malden.

Marshland, Norfolk.—Ministry have approved R.D.C.'s housing programme comprising 39 dwellings.

Methwold, Norfolk.—Air Ministry have submitted to C.C. for approval, plans for proposed new village at Methwold to accommodate officers and men serving on the Mildenhall and Lakenheath U.S.A.F. bases.

Middlesbrough, Yorks.—Corporation Housing Committee considering building of 16-storey blocks of flats.

Morpeth, Northumb.—J. Campbell Smith, Ltd., Alnwick, are to erect houses at the corner of Lynemouth and Cresswell Road, Ellington, and plans have been approved.

Mottingham, Kent.—L.C.C. approved a scheme for the erection of a two-storey block of one-room flats for old people at Hassop Walk, Mottingham estate, Estimated cost £14,785.

Newcastle upon Tyne.—City architect has prepared amended plans for six blocks of four-storey flats in Dovercourt Road (Walker Road), and three blocks in the Napier Street area.

Newport, I. of W.—B.C. have approved a housing programme of 24 dwellings at John Street.

Northumberland.—William Leech, Ltd., St. James Street, Newcastle upon Tyne are seeking permission from the planning authorities to erect single persons' flats at Blyth, Bedlington and Seaton Valley. It is understood that similar dwellings are proposed on other estates being developed in the north-east by the company.

Ottery St. Mary, Devon.—Ministry have approved U.D.C.'s scheme for the purchase of land at Higher and Lower Shutes Mead for the erection of 70 to 80 houses.

Poplar.—B.C. recommended to appoint H. Moncrieff, of Co-operative Planning, Ltd., 72 South Side, Clapham Common, S.W.4, as the architect for planning and development of the main undeveloped area in the St. John's parish area, and for the completion of plans for the housing development of the site on the west side of Newby Place; appoint Norman and Dawbarn, 7 Portland Place, W.1, as the architects for the planning and housing development of the site of Bow Baths and the McCullum Road clearance area; appoint Thomas Barrett, Sons and Partners, 50 Pall Mall, S.W.1, as the quantity surveyors for the housing scheme at west side of Newby Place.

Reading, Berks.—B.C. recommended to approve in principle the erection of aged persons' dwellings at the junction of Shinfield Road and Whitley Road, and 27 three-bedroom dwellings and 28 garages at the walled garden, Surley Row and Grove Road, Emmer Green.

Redcar, Yorks.—Bradley and Co. (Builders), Ltd., York, are to develop the Ings Farm estate, where provision is made for 360 bungalows and about 80 houses. The scheme is being considered by the planning authorities.

Rushden, Northants.—U.D.C. to invite tenders shortly for the erection of a 2-storey block of 4 single bedroom flats and 3 garages at junction of Talbot Road and Rose Avenue.

Shildon, Dur.—U.D.C. Surveyor has prepared layout plans for the erection of 20 bungalows at Middleton Road.

Spenborough, Yorks.—Housing Committee have approved in principle revised layout for bungalows and flats for the Healds Hall estate Liversedge.

Stepney.—B.C. recommended to appoint Harris and Porter, 3 Robert Street, London, W.C.2, as the quantity surveyors for housing schemes at Limehouse Fields estate (Carr Street extension) and Stepney Green area.

Stowmarket, Suffolk.—U.D.C. have approved revised draft layout plan for 60 semi-detached bungalows and 24 semi-detached houses at Chilton Hall estate.

Sunderland, Dur.—J. W. Ridley, Ltd., 33 West Sunnyside, are to erect 60 houses at East Herrington. W. and T. R. Milburn architects, 4 Grange Terrace.

Sutton and Cheam, Surrey.—B.C. recommended to grant outline planning permission, subject to conditions, for the demolition of workshops, etc., and erection on site of 42 flats in one three-storey block, with 42 garages, and construction of new access road at the corner of Farm Way and Lavender Avenue, Worcester Park, for Lavender McMillan (Contractors), Ltd., 54 Cheam Common Road, Worcester Park.

Thornaby-on-Tees, Yorks.—B.C. planning large-scale housing developments on the site of a former airfield. A report on the project has been prepared by E. G. Lediard, consulting engineer, Eldon Square, Newcastle upon Tyne. Application is to be made to revise the town map to allow the scheme to be carried out.

Thornaby-on-Tees, Yorks.—Borough engineer to prepare a scheme for single persons' dwellings at Scalby Square.

Tonbridge, Kent.—R.D.C. have approved 1961-62 housing programme, comprising four flats at the Glebe, Bidborough, two houses and eight flats at Falmouth Place, Five Oak Green, six houses at Old Hill, Lamberhurst, eight flats at Oakfield Road, Matfield, and 18 houses off Mount Pleasant, Paddock Wood.

Twickenham, Middx.—B.C. recommended to approve, in principle, subject to Ministry approval, scheme for the conversion of 18 and 20 Udney Park Road, Teddington, into eight

old people's homes, and 45 Waldegrave Park, Twickenham, into 11 flats.

Uckfield, Sussex.—R.D.C. to submit to Ministry for approval 1961 housing programme, comprising 40 dwellings at sites at Forest Row, Hartfield, Mayfield, Crowborough, Uckfield, Fletching and Frainfield.

PLAYING FIELDS, PARKS, ETC.

Ashington, Northumb.—U.D.C. have approved expenditure of £15,970 for additional works, including the removal of playground equipment to another site in Ashington Park and the provision of a paddling pool.

Bradford, Yorks.—City Council recommended to approve for inclusion in the 1961-62 programme, scheme for the provision of playing fields, phase 2, at St. Bede's Grammar School, estimated cost £11,000, and improvements to Woodhall playing field at the institute of technology, £5,000.

Buckfastleigh, Devon.—U.D.C. to invite tenders for the levelling and development of the Dickspond playing field.

Frimley and Camberley, Surrey.—U.D.C. have approved plans for provision of a football and rugby pitch and cricket square at Frimley Green, estimated cost £2,065; approved in principle scheme for the provision of two football pitches, a cricket square, park for 50 cars, a four-rink bowling green and four hard tennis courts at Old Dean Common, £8,662.

Lancaster.—City Council have approved in principle scheme for the development of the Greaves Park area incorporating the Greaves playing field and the grounds of Greaves House and Parkfield as a complete unit for the purpose of public pleasure grounds.

Merthyr Tydfil, Glam.—B.C. to submit to M.E. for approval a scheme for the development of the Llyn Field, near Heolgerig, as a playing field to provide facilities for the College of Further Education, the Youth Service, and those secondary schools which have no playing fields of their own.

Southgate, Middx.—B.C. have submitted to Local Education Authority for approval, scheme for improvements to playfields at Mitchenden Secondary Grammar School. Estimated cost £2,000.

Twickenham, Middx.—Co. E.C. recommended to approve the laying out of the playing field and garden surrounds at Broom Road Secondary School. Estimated cost £6,950.

Willesden, Middx.—Co. E.C. recommended to approve the laying out of garden surrounds at Northview Primary School. Estimated cost £1,590.

Worthing, Sussex.—B.C. recommended to approve scheme for the provision of a children's compound at Brooklands. Estimated cost £2,750.

RIVER AND FLOOD PREVENTION WORKS

Llanfyllin, Monts.—R.D.C. to apply for sanction to borrow £71,000 for flood prevention scheme at Llanfair Caereinion.

Newbury, Berks.—B.C. have approved scheme for repairing breach in the river bank at the sewage disposal works. Estimated cost £2,000.

Somerset.—River Board are to prepare plans for improvements to Hawcombe stream, Horner water and Doniford stream, in the Williton area. Estimated cost £1,765, £5,000 and £1,975 respectively.

ROADS, BRIDGES AND SITE WORKS

Bromley, Kent.—B.C. recommended to prepare plans for the making-up of Barfield Road, between Blackbrook Lane and Golf Road.

Broxbourne, Herts.—C.C. recommended to approve scheme for the improvements of Bell Lane. Estimated cost £8,000.

Corby, Northants.—U.D.C. have approved plans for widening Church Street.

East Barnet, Herts.—C.C. recommended to approve, subject to grant aid revised scheme for the reconstruction of the London Transport Executive's railway bridge H.B.65 over the Great North Road, A.1000, East Barnet, together with road improvement works to the approaches and provision of a footway northwards to Station Approach. Estimated cost £125,230.

Eastbourne, Sussex.—B.C. recommended to apply for sanction to borrow £4,170 for the construction of Port Road, from Manor Road to the northern boundary of the Highfield Junior School site, and £2,076 for site work and construction of roads, footpaths and sewers for three two-storey blocks of four flats adjoining Green Street Farm Cottages; prepare scheme for improvements to Friday Street, at junction with Oak Tree Lane and Shinewater Lane.

Hertfordshire.—C.C. recommended to approve the concreting of yard at Summerswood Farm, Dyrham Park estate. Estimated cost £1,100.

Llandudno, Caerns.—U.D.C. have approved scheme for the reconstruction of Upper Mostyn Street. Estimated cost £5,700.

Londonderry.—Ministry of Commerce have designated as part of a trunk road a length of new roadway to be constructed at Macosquin. The road will commence at Somerset, adjacent to the Chemstrand factory and extend for a distance of 2½ miles by way of Farrenlester to the main Coleraine-Limavady road to Ardverness. Estimated cost £200,000.

Loughborough, Leics.—B.C. recommended to approve and submit to Divisional Road Engineer, for approval, detailed plans of a major improvement on the trunk road, A.6, from the aerodrome site, Derby Road, to Dishley Toll Gate. Estimated cost £78,600.

Morley, Yorks.—B.C. recommended to prepare plans for the improvement of the A.650 and A.62 trunk roads.

Norfolk.—Highways Committee recommended to approve and submit to Ministry for approval, scheme for the erection of a new bridge over the Ouse at Downham and for the provision of a new approach road on the east side of the bridge.

Portland, Dorset.—U.D.C. have approved scheme for improvement works at the High Street. Estimated cost £1,000.

Rickmansworth, Herts.—C.C. recommended to approve subject to grant aid scheme for the reconstruction of the existing railway bridge over Tolpits Lane. Estimated cost £17,182.

Rhyl, Flints.—U.D.C. to apply for sanction to borrow £4,900 for extending the parking facilities at Greenfield Place motor coach park.

Tunbridge Wells, Kent.—B.C. recommended to proceed with the construction of a 9ft. wide footpath at the western side of Hilbert Road.

Tyrone.—C.C. propose to resurface one mile of the Irvinestown-Dromore road during 1961-62.

Wimbledon, Surrey.—Highways and Sewerage Committee have approved, subject to grant aid, scheme for the improvement of the corner at Lambton Road with Coombe Lane. Estimated cost £2,250.

Woolwich.—B.C. recommended to surface with tarmacadam land between the rear of a multi-storey garage and Warren Lane. Estimated cost £3,500.

SEWERAGE, SEWAGE AND REFUSE DISPOSAL

Blofield and Flegg, Norfolk.—R.D.C. to proceed with a 2-stage sewerage scheme for Cantley. Estimated cost £39,200.

Brackley, Northants.—C.C. have approved in principle R.D.C.'s Lower Middleton Cheney main drainage scheme. Estimated cost £25,720.

Bradford, Yorks.—City Council recommended to apply for sanction to borrow £78,500 and invite tenders for the provision of specialised heat treatment plant to deal with humus sludge at the Esholt works.

Bury, Lancs.—B.C. expects to invite tenders in April for the construction of the following:—(a) Parr Brook and Manchester Road Sewers—(a) Parr Brook Sewer consisting of approximately 1,030 lin. yd. of 57in./63in. dia. pipes and 1,900 lin. yd. of 27in./42in. dia. pipes stilling pond storm water overflow, and 27in dia. steel pipe crossing of the River Roch. (b) Storm Water Culvert consisting of approximately 400 lin. yd. of 60in. dia. pipes, 100 lin. yd. of which will be in tunnel and outlet works in River Roch, and (c) Manchester Road Sewer, consisting of approximately 300 lin. yd. of 36in. dia. pipes and 530 lin. yd. of 30in. dia. pipes and storm water overflow.

Cockermouth, Cumb.—R.D.C. have approved the spending of £9,000 on the construction of a relief sewer at Lowca Lane, culverting of Link Beck, and construction of a public convenience.

Daventry, Northants.—C.C. have approved in principle R.D.C.'s Charwelton Sewerage and Sewage disposal scheme. Estimated cost £13,400.

Freebridge Lynn, Norfolk.—R.D.C. preparing detailed plans for the Grimston sewerage scheme.

Frome, Som.—R.D.C. to submit to Ministry for approval and loan sanction sewerage and sewage disposal scheme for Wanstrow. Estimated cost £26,200.

Guildford, Surrey.—R.D.C. have submitted to C.C. for approval, scheme for the provision of main drainage for the village of Holmbury St. Mary and a number of adjoining housing estates. Estimated cost £128,000.

Haverfordwest, Penbs.—Ministry have approved in principle, sewerage scheme for the borough for B.C. Estimated cost £257,000.

Kettering, Northants.—C.C. have approved in principle R.D.C.'s Ashley, Sutton Bassett and Weston-by-Welland sewerage and sewage disposal scheme. Estimated cost £68,500.

Luton, Beds.—B.C. recommended to approve plans for the construction of a foul water sewer at Sandgate Road.

Reading, Berks.—B.C. recommended to invite tenders for the construction of a 9in. asbestos-cement rising main beside the 4in. diameter main at Kidmore End Road.

Rochdale, Lancs.—B.C. recommended to negotiate a tender for the reconstruction of the storm water overflow adjoining Union Ring Mills.

Uppingham, Rutland.—R.D.C. to prepare drainage schemes for Bisbrooke and Seaton and final plans for the Ridlington sewerage scheme.

Wigan, Lancs.—R.D.C. consulting engineers are preparing sewerage and sewage disposal scheme for Appley Bridge area of the parishes of Shevington and Wroughton.

STREET LIGHTING

Ashington, Northumb.—U.D.C. have approved expenditure of £2,600 for improved lighting in Third and Fourth Avenues, the extension to Hawthorn Road from these avenues and the first section of Alexandra Road, Woodhorn Road to Second Avenue, and £470 for improved lighting at Park Road and Park View.

Golborne, Lancs.—U.D.C. to spend £9,900 on street lighting improvement in the town.

Looe, Corn.—U.D.C. have approved scheme for the provision of new street lighting throughout the Town. Estimated cost £8,700.

Thornaby-on-Tees, Yorks.—Plans and Works Committee have approved in principle proposals for conversion of the remaining gas lighting to electric lighting at an estimated cost of £30,000 within the financial year 1961-62.

Luton, Beds.—B.C. recommended to approve the provision of street lighting in Villa Road (part).

Wortley, Yorks.—R.D.C. propose street lighting schemes at Ecclesfield, Chapeltown, High Green, Thorpe Hesley, Wadley and Loxley. Estimated cost £9,900 and better street lighting at Colley £7,000.

CONTRACTS

Full details of the Contracts marked * will be found in our Advertisement Columns.

BUILDING AND DECORATING (See also Housing Schemes)

Ammanford, Carm.—External painting of 68 houses for U.D.C. The total number of units is divided into three contracts comprising 18, 20 and 30 units respectively. Documents from the Engineer and Surveyor. Council Offices, College Street, Ammanford. Deposit £1 1s. Tenders by April 7.

Armagh.—Supply and hanging of steel shutters and grills at R.U.C. County Headquarters for the Ministry of Finance. Documents from Room 103, Law Courts Building, Belfast, 1. Tenders by April 6.

Aylesbury, Bucks.—Alterations to the settling office at the cattle market, comprising the addition of first-floor office accommodation, with toilets, internal staircase and inquiry office on the ground floor, also repainting and redecorating the existing building, for B.C. Documents from the Borough Engineer and Surveyor, Friarscroft, 3 Oxford Road, Aylesbury. Deposit £2 2s. Tenders by April 17.

Belfast.—Construction of a Scout Hall at Oohir Gardens for the 6th Belfast Scout Group. Documents from Ogilby and McCutcheon, quantity surveyors, 9 Upper Crescent, University Road, Belfast, 7. Deposit £3 3s. Tenders by March 29.

Belfast.—Six shops and six maisonnettes at Turf Lodge estate for City Council. Documents from the City Architect's Department, Housing Section, 97 Townsend Street, Belfast, 13. Deposit £5 (cheque payable to the Belfast Corporation). Tenders by April 4.

Blackpool, Lancs.—Erection of a four-storey building, comprising three shops and 10 flats, on the site of existing property, 369 Promenade, and adjacent shops, Alexandra Road for B.C. The contract includes the demolition of this existing property. Documents from Fairbrother, Hall and Hedges, chartered architects, 2 Birley Street, Blackpool. Tenders by April 20.

Blofield and Flegg, Norfolk.—External painting of 518 Council houses and bungalows in various parts of the district for R.D.C. Documents from the department of the Housing Manager, Council Offices, Acle, Norwich. Tenders by April 3.

Blyth, Suffolk.—Erection of public conveniences adjacent to the Gannon Room, Walberswick, for R.D.C. Documents from the Surveyor, Council Offices, Rendham Road, Saxmundham. Tenders by April 11.

Bournemouth, Hants.—Erection of a new canopy and general modernisation to the main

entrance of the pavilion, Westover Road, for B.C. Documents from the Borough Architect's Office, Room 106, Town Hall, Bournemouth. Deposit £1 ls. Tenders by April 12.

Brighouse, Yorks.—External painting of following for B.C.: (Group 1) 96 houses at Oaklands, Rastrick; (2) 43 pre-fab. bungalows at Chapel Croft; (4) Clifton Hopsital flats at Whinney Hill; (3) 50 pre-fab. bungalows and lodge; (5) Stoneleigh, Halifax Road. Documents from the Borough Engineer, Commercial Street, Brighouse. Tenders by April 7.

Canvey Island, Essex.—Erection of public conveniences and shelters and ancillary work at Eastern Esplanade for U.D.C. Documents from R. H. Stevens, engineer and surveyor, Council Offices, Canvey Island. Deposit £1 Tenders by April 7.

Chislehurst and Sidcup, Kent.—Paper baling shed, supply and erection of steel or concrete frame building, covered corrugated asbestos, approximately 28ft. by 105ft. by 13ft. high, for U.D.C. Applications to Engineer and Surveyor, Manor House, The Green, Sidcup, by March 30.

Chislehurst and Sidcup, Kent.—External painting 173 properties (in two groups). Applications to Housing Manager, Council Offices, Sidcup Place, Sidcup, by March 27.

Devizes, Wilts.—Works to provide modern conveniences at 14 Council houses at New Road, Bromham, for R.D.C. Documents from the Surveyor, Council Offices, Browfort, Devizes. Tenders by March 30.

Down.—New and repair work to schools for Co. E.C. Contracts under consideration are: Building; structural steel; heating; lighting; plumbing; painting; general repairs; floors; floor maintenance machines; tilers; plasterers; glaziers; playgrounds; playing fields; tennis courts and grounds; asphalters; fencing; gates; railings; horticultural machines (grass maintenance); well sinkers; roofing contractors; suspended ceilings; steel windows; blinds and curtains; fire fighting equipment (extinguishers); service engineers (mechanical). Applications to the Director of Education, 7 Brunswick Street, Belfast, 2, by March 29.

East Dereham, Norfolk.—Erection of a house and shop at Hyde Road, Moorgate estate, for U.D.C. Documents from Tuthill and Burton, architect and surveyors, 4b Market Place, Dereham. Deposit £2 2s., payable to Council. Tenders by April 10.

East Dereham, Norfolk.—External painting of Council houses in groups as follows for U.D.C.: Twenty-six houses, Jubilee Avenue; 22 houses, Becclesgate estate; 26 houses, Moorgate Road, three bungalows, Southend. Documents from the Housing Officer, Assembly Rooms, Dereham. Tenders by April 11.

East Riding.—Covering foldyards on the small holdings estates Skirlaugh and South Cave for C.C. Documents from the County Land Agent, County Hall, Beverley. Tenders by March 28.

East Suffolk.—Erection of modern school at Bacton, Stowmarket, for C.C. Submit names by April 6. Tenders by May 12.

Erith, Kent.—Sports pavilion at Northumberland Heath Playing Fields for B.C. Applications by March 27. Deposit £2 2s. Tenders by May 5.

Haslingden, Lancs.—External painting programme, 1961, including the following contracts for B.C.: Public buildings—(a) municipal offices and 57 Bury Road; (b) public library, Deardengate; (c) destructor buildings (Prinny Hill); (d) bus shelters; (e) Worsley Park bowls house, etc. (internal and external); (f) railings at public baths; housing—(1) 49 houses, Helmsore and Clarence (part) estates; (2) 46 houses, 16 flats, Longshoot estate; (3) 98 houses, eight flats, Broadway estate; (4) 40 houses, four flats, Broadway estate; (5) 17 houses, 28 flats, Top of Town estate. Documents from Borough Surveyor, Municipal Offices, Bury Road, Haslingden. Tenders by April 10.

Hull.—Erection of a fire station in Calvert Lane for City Council. Documents from Williams, Sleight and Co., architects, 6 Wright Street, Hull. Deposit £2 to City Treasurer. Tenders by March 29.

Isle of Wight.—Following for R.D.C.: (a) External painting of houses at Bembridge, Brading, Brighthorne, Calbourne, Freshwater, Niton, Rookley, Thorley, Shaftlet, and Shorwell; (b) the re-roofing of six houses at Camp Road, Freshwater. Documents from Clerk of the Council, 30 Pyle Street, Newport, I. of W. Tenders by April 3.

Kent.—Construction of the Stourmouth land drainage pumping station in brick and reinforced concrete to house four 30in. diameter pumps for Kent River Board. The site is near West Stourmouth, about 7 miles north-east of Canterbury. Apply, in writing, to the Engineer to the Board, 78 College Road, Maidstone.

Kerry, Eire.—Erection of a proposed public house at Waterville for O. B. Lucey, in accordance with the drawings and documents from Kelly and Barry, architects, 29 South Mall, Cork. Deposit £10 10s. Tenders by March 30.

Lanarkshire.—Painter work at the following for Co. E.C.: Kirkshaws P. School, Coatbridge—extension; Cathkin P. School, Rutherglen—extension. Written applications to D. G. Bannerman, county architect, 34 Albert Street, Motherwell, by March 25.

Lancashire.—Alterations to existing two-storey traditional building to form divisional education offices, including services and finishes for C.C. Applications to County Architect, P.O. Box 26, County Hall, Preston, by March 27.

Launceston, Corn.—Conversion of market buildings to pannier market for B.C., comprising in the main, the walling in of two open buildings with ancillary works of roofing and drainage. Documents from the Borough Surveyor, Municipal Offices, Launceston. Tenders by April 1.

Lisnaskea, Fermanagh.—Erection and completion, including all site works, of a new rectory at Castlebalfour, Lisnaskea, for Select Vestry. Documents from T. H. Ellis, Hon. Treasurer of Lisnaskea Parish, Main Street, Lisnaskea. Tenders by March 27.

Liverpool.—External painting of following for City Council: (a) Five hundred and twenty-three dwellings and 33 lock-up garages, Westvale, Kirkby estate; (b) 114 multi-storey flats, Coronation Court, Lower Lane, East Lancashire Road; (c) 80 multi-storey maisonnettes, Cresswell Mount, Boyd Street, Liverpool. 5. Documents from City Architect and Director of Housing, Blackburn Chambers, Dale Street, Kingsway, Liverpool. 2. Deposit £2 2s., payable to City Treasurer. Tenders by April 13.

Liverpool.—Extensions to Fulwood Park Nursery for City Council. Documents from City Architect and Director of Housing, Blackburn Chambers, Dale Street, Kingsway, Liverpool. Deposit £2 2s., payable to City Treasurer. Tenders by April 4.

Lleyn, Caerns.—Erection of public conveniences at Nefyn for R.D.C. Documents from R. G. Roberts, clerk of the Council, Metro Buildings, Pwllheli. Deposit £2 2s. Tenders by April 10.

March, I. of E.—Improvement works at 16 houses in Wisbech Road for U.D.C. The works generally comprise the installation of hot water systems, internal w.c.s, lavatory basins, sinks, additions to the electrical installations, etc. Documents from W. S. Pickett, engineer and surveyor, Town Hall, March. Deposit £1 ls. Tenders by March 30.

Maltby, Yorks.—Painting of 66 houses situated at Cliff Hills estate, off Rotherham Road, for U.D.C. Documents from A. Carlin, housing manager, Council Offices, Rotherham Road, Maltby. Tenders by April 17.

Middleton, Lancs.—Externally painting 303 dwellings, to be tendered for in separate lots, for B.C. Boarshaw estate, 119 houses, three-bedroom; Boarshaw estate 34 houses, three-bedroom; Rhodes, 49 houses, three-bedroom; Rhodes, 63 houses, three-bedroom; Hollin estate, 38 dwellings, two-bedroom. Documents from the Borough Architect, Town Hall, Middleton, near Manchester. Tenders by April 3.

Northwich, Ches.—External painting of 307 houses on the Leftwich estate for U.D.C. Documents from the Engineer and Surveyor, The Council House, Church Road, Northwich. Tenders by April 1.

Nottingham.—Adaptations to ladies' toilets at Noel Street baths for City Council. Documents from F. M. Little, city engineer and surveyor, The Guildhall, Nottingham. Deposit £2. Tenders by April 5.

Nottingham.—Alterations and extensions to Blenheim School kitchen, Squires Avenue, Bulwell, for City Council. Documents from F. M. Little, city engineer and surveyor, The Guildhall, Nottingham. Deposit £2. Tenders by March 30.

Nottingham.—Cleaning and painting at the following buildings for City Council: Internal and external—Bells Lane playing field (pavilion and fencing), Cinderhill; Deering School, Coronation Avenue, South Wilford; Dunkirk School, Montpelier Road; Valley Road playing fields (pavilion and fencing), Basford; St. Alban's playing field dressing rooms, St. Alban's Road, Bulwell; Cottesmore School dining rooms, Lenton Boulevard; internal—Dale School, Ena Avenue, Sneinton Dale; Sneinton Institute, Beaumont Street, Sneinton; The Manning School, Gregory Boulevard; external—Beechdale School, Beechdale Road, Aspley; Heatherley Drive site fencing, Valley Road, Basford; Huntingdon School kitchen and dining rooms, Huntingdon Street; Old Park community centre, Morval Road, Wollaton; Radford community centre, Highhurst Street; Sycamore Youth Club, Lilac

Street. Particulars from the Education Office (Sites and Buildings Department), Exchange Buildings, Smithy Row, Nottingham. Deposit £1 each specification. Tenders by April 10.

Oldham, Lancs.—Erection of veterans' pavilion, Werneth Park, for B.C. Documents from Cameron and Middleton, chartered quantity surveyors, 21 Mumps, Oldham. Deposit £2 2s., cheques payable to Borough Treasurer. Tenders by April 13.

Peterborough, Northants.—Supply and erection of a prefabricated timber building for City Council. Documents from City Engineer, Town Hall, Peterborough, by March 27, with details of similar contracts executed and sites where they can be inspected.

Peterborough.—Erection of a large gymnasium and two pairs of staff houses at St. John's School, Apethorpe, for The Governors. Submit names to F. J. Lenton and Partners, architects, 16 Broad Street, Stamford, Lincs.

Portsmouth.—Modernisation at Portsea for City Council: Beresford House (eight flats); Emanuel House (eight flats). Applications to the Director of Housing, 1 Clarence Parade, Southsea, by March 30. Deposit £1.

Preston, Lancs.—Erection of branch library and eight shops with 13 maisonnettes over, all one block, at Savick estate for B.C. Documents from the Borough Engineer and Surveyor, Municipal Building, Preston. Deposit £2 2s. Tenders by April 10.

Reading, Berks.—External painting of the following for B.C.: One hundred and forty-four dwellings, Whitley estate; 118 houses, Whitley estate; 66 houses, Whitley estate; 141 houses, Bath Road estate; 128 houses, Whitley estate; 60 flats, Elizabeth House, Gosbrook Road. Documents from the Housing Manager, Town Hall, Reading. Tenders by April 7.

Redcar, Yorks.—Painting of 386 council houses for B.C. Documents from Borough Engineer (Ridley House), Coatham Road, Redcar. Tenders by March 30.

Reeth, Yorks.—Following for R.D.C.: (Contract 1) External painting of 14 council houses at Reeth; (2) external painting of two council houses at Gunnerside; (3) laying of 100yd. of field pipes at Healaugh. Documents from J. V. Metcalfe, public health inspector and surveyor, Council Offices, Reeth, Richmond. Tenders by April 4.

Rugby, War.—External painting of houses, 1961/62 programme, for R.D.C., including: (Scheme a) Brinklow 28, Bourton 10, Brandon 10; (b) Wolston 118; (c) Long Lawford 213 (including five shops). Documents from the Engineer and Surveyor, 16 Warwick Street, Rugby. Tenders by April 11.

Rutland.—Proposed extensions at Great Casterton Secondary Modern School, consisting of a two-storey block of six classrooms together with ancillary accommodation for Co. E.C. Documents from the office of the County Architect and Planning Officer, County Offices, Catmose, Oakham. Deposit £2 2s. Tenders by April 17.

St. Albans, Herts.—External painting of 427 houses, two old folk's bungalows and 37 garages for City Council. Documents from the office of the City Engineer and Surveyor, 16 St. Peter's Street, St. Albans. Deposit £2 2s. Tenders by April 10.

Salcey, Ches.—Erection of brick sports pavilion, Moor Nook, having a floor area of approximately 925 super. ft. for B.C. Documents from the Borough Engineer, Town Hall, Sale. Deposit £2 2s. Tenders by April 17.

Sandown-Shanklin, I. of W.—Construction of public sanitary conveniences on Shanklin Esplanade at the rear of the Spa Hotel site for U.D.C. Documents from Surveyor's Office, Town Hall, Sandown, I. of W. Deposit £2 2s. Tenders by March 30.

Scotland.—Construction of a P.O.L. storage depot in the Campbelltown area for N.A.T.O. Refer to our issue of March 16, page 1405.

Seaham, Dur.—Repairs to the following houses for U.D.C.: 4 Earl Street; 48 Marlborough Street; 13 Lord Street. Documents from F. A. Anderson, clerk of the Council, Council Offices, Seaham. Tenders by April 5.

Selkirk.—Erection of primary school at Yarrow for C.C.: Excavator, concrete, brick, etc., work; carpenter, joiner, ironmonger, etc., work; plumber, etc., work; plaster, cement and roughcast work; painter and glazier work; electrical work. Applications to John C. Hall, Master of Works, Ladhope Vale, Galashiels, by March 28.

Shrewsbury, Salop.—External painting of houses on the Cotton Hill estate for B.C., including: (Contract 1) 60; (2) 65; (3) 65. Documents from the Borough Surveyor, Guildhall, Shrewsbury. Tenders by April 4.

Southport, Lancs.—Erection of a steel-framed building, including cladding, roof lights and doors, to form an extension to the present bus depot at Canning Road for B.C. Documents from the Borough Architect and Town Planning Officer's Department, 99-105 Lord Street, Southport. Deposit £1 ls. Tenders by April 13.

Stocksbridge, Yorks.—Internal painting of the Town Hall for U.D.C. Documents from D. E. Robinson, Council's surveyor, Town Hall, Stocksbridge, Sheffield. Tenders by April 10.

Stockport, Ches.—Construction of a single-storey nursery school at Brinnington Road, Portwood (adjoining St. Paul's Primary School) for B.C. Documents from the Borough Architect, Town Hall, Stockport. Tenders by April 18.

Stockport, Ches.—Phase 2, Stockport College for Further Education for B.C., comprising eight-storey electrical engineering and communal block, two-storey assembly block, R.C. frame, piled foundations. Submit names to the Borough Architect, Town Hall, Stockport, by noon April 4. Documents will be available May. Tenders due June.

Stroud, Glos.—Substantial repairs to stone-work and re-roofing work at Stroud Subscription Rooms for U.D.C. Submit names to W. D. Wilson, clerk of the Council, Council Chambers, High Street, Stroud, by March 25. Deposit £2 2s. cheque.

Sunderland, Dur.—Alterations and repairs to 24 St. George's Square, for B.C. Documents obtainable from Borough Architect, Grange House, Stockton Road, Sunderland. Tenders by March 28.

Tadcaster, Yorks.—The erection of two brick garages, internal size 16ft. 3in. x 8ft. at 31 Auster Bank View for R.D.C. Documents from the Engineer and Surveyor, Council Offices, Tadcaster. Deposit £1. Tenders by April 8.

Thame, Oxon.—Following for U.D.C.: (1) External repainting of 24 council houses; (2) replacement of defective metal casements with wooden casements. Documents from the Surveyor, Town Hall, Thame. Tenders by April 15.

Towcester, Northants.—External painting of houses for R.D.C.: (Contract 229) Twenty-two houses, School Road, Ascote; (230) four houses, Bury Hill, Bradden; (231) 38 houses, Ridgmont, Deanshanger; (232) 28 houses and two bungalows, Ridgmont, Deanshanger; (233) 38 houses, Ridgmont, Deanshanger; (234) four houses (two Swedish timber), Bugbrooke Road, Gayton; (235) 32 houses, Kingsley Road, Silverstone; (236) 34 houses, Kingsley Road, Silverstone; (237) 30 houses and eight bungalows, Kingsley Road, Silverstone; (238) 14 houses, Vicarage Close, Whittlebury; (239) seven houses and four bungalows Church Close, 11 houses, St. John's Lane and one house, Deanshanger Road, Wicken; (240) 10 houses, Blakesley Road, four houses, Main Street and four houses Plumpton Road, Woodend. Erection of new houses: (241) Erection of two pairs of two-bedroom houses (type 9), together with foul sewers, fencing, etc., at Sanders Lane, Potterspury. Documents from the G. Berridge, surveyor, 163 Watling Street West, Towcester. Deposit £1 1s. each contract. Tenders by April 5.

***Twickenham, Middx.**—External painting of houses and flats on 11 corporation estates for B.C. Deposit £2 2s. Tenders by April 7.

Walsall, Staffs.—Erection of a new science laboratory block at the Richard C. Thomas Secondary School, Field Road, Bloxwich, having a prefabricated timber superstructure fixed by specialists for B.C. This is a single-storey block of two laboratories of 960 sq. ft. each with stores and preparation rooms. Documents from M. E. Habershon, borough engineer and surveyor, Council House, Walsall. Deposit £2 2s. Tenders by March 29.

Wath-upon-Deane, Yorks.—Extension of the Town Hall for U.D.C. Documents from the office of the Engineer and Surveyor, Town Hall, Wath-upon-Deane. Deposit £1 1s. Tenders by April 10.

West Riding.—Internal decoration of the Calder College of Further Education, Todmorden, for C.C. Documents from Divisional Education Officer, Education Offices, Hall Street, Todmorden. Tenders by March 30.

West Suffolk.—Painting and repairs, also various minor works during the summer holiday period at any of the following for C.C.: Primary Schools—Assington County; Beyton County; Brandon County; Bury St. Edmunds Guildhall Feoffment County; Elmswell County; Lakenheath County; Mildenhall Beck Row County; Newmarket All Saints' Aided Voluntary; Newmarket Leureate County; and Polstead County. Secondary Schools—Beyton Modern; Bury St. Edmunds King Edward VI Grammar; Bury St. Edmunds Silver Jubilee Modern (boys and girls, and including kitchen); Clare Modern; Isworth Modern; and Mildenhall Modern. Exterior works may be carried out in term time. Apply to the County Architect, 13 Westgate Street, Bury St. Edmunds.

Whitewell, Yorks.—General building work of a booster station at Laund Wood, near Whitewell, for the Fylde Water Board. Documents from the Engineer, Fylde Water Board, Sefton Street, Blackpool. Tenders by April 14.

Whitstable, Kent.—Construction of a garage in brickwork and with a reinforced concrete roof, together with attendant site works in drainage and providing a hard standing for U.D.C. Documents from the office of the Engineer and Surveyor, The Castle, Whitstable. Tenders by April 6.

Wigan, Lancs.—Exterior painting of 12 traditional houses on the Hampson Green housing site at Haigh, 62 houses and five temporary bungalows on the Dangerous Corner housing site at Wrightington and 26 houses and four bungalows on the Alder Lane housing site at Parbold for R.D.C. Documents from J. Holding, surveyor to the Council, 10 Bridgeman Terrace, Wigan. Tenders by April 10.

Williton, Som.—Construction of a public convenience at Blue Anchor for R.D.C. Documents from the Engineer and Surveyor, Council Offices, Fore Street, Williton. Deposit £2 2s. Tenders by May 2.

Wisbech, L. of E.—External painting of approximately 140 Council dwellings for R.D.C. Documents from the Housing Officer, Council Offices, Alexandra Road, Wisbech.

Woodbridge, Suffolk.—Erection of a block of six garages at Newham Avenue for U.D.C. Documents from the Surveyor's Office, Eden Lodge, Woodbridge. Tenders by March 28.

Worcester.—Erection of the second stage in the redevelopment of the livestock market for City Council. This stage comprises new pig market, offices, cafeteria and toilets. The total floor area of these buildings is in the region of 18,000 sq. ft. Submit names to the City Engineer and Surveyor, 22 Bridge Street, Worcester, by April 12.

Worcester.—Schools redecoration, 1961—exterior programme for City Council, including: (1) Gorse Hill Junior Mixed School; (2) Ronkswood Junior Mixed School; (3) Nunnery Wood Junior Mixed and Infants' School (excluding new classroom block); (4) Comer Gardens Junior Mixed and Infants' School; (5) Red Hill Junior Mixed and Infants' School; (6) Victoria Institute Technical College (north and west elevations only). Documents from City Engineer and Surveyor, 22 Bridge Street, Worcester. Deposit £2 2s. Tenders by April 11.

Worcestershire.—Two new classrooms, a kitchen and ancillary rooms at Cleeve Prior C.E. School for Co. E.C. The construction is generally of steel frames with timber and brick walling, together with the usual services. The area of the building amounts to 2,658 sq. ft. Applications to Pemberton and Bateman, chartered architects, 21 Vine Street, Evesham, by March 28. Plans also seen at the County Architect's Office, 14 Casle Street, Worcester.

Worksop, Notts.—Erection of two public conveniences on separate sites at Scrooby Road, Harworth, for R.D.C. Documents from Council's Surveyor, Council Offices, Highfield House, 222 Carlton Road, Worksop. Tenders by March 28.

Worsley, Lancs.—A timber overlay in the Assembly Hall, Town Hall, for U.D.C. Documents from the Engineer and Surveyor, Town Hall, Walkden. Tenders by April 5.

Yeovil, Som.—Construction of engineering workshops and for vehicle accommodation at West Hendford for the Southern Electricity Board, No. 4 (Bournemouth) sub-area. The works consist of the erection of single-storey brick buildings having a total floor area of 18,000 sq. ft. or thereabouts. This stage completes the total development on this site. Documents from the Sub-area Engineer, Southern Electricity Board, 1 Priory Road, Bournemouth. Deposit £5 5s. Tenders by May 3.

CLOTHING AND TEXTILES

Belfast.—Supply of uniform clothing, waterproof coats, boiler-suits, uniform caps, P.V.C. protective clothing, rubber boots, etc., for Harbour Police and other employees in accordance with the Commissioners' samples for the Harbour Board. Documents from the Harbour Office, Belfast. Tenders by April 6.

Leeds.—Following for City Council: (a) Making-up (i.e., C.M.T.) uniform clothing; (b) waterproof coats; (c) uniform caps. Documents from Thos. Lord, general manager, 1 Swingate, Leeds, 1. Tenders by April 7.

Manchester.—Supply of uniform, shirts, footwear, etc., to the fire brigade for City Council. Documents from Chief Officer City of Manchester Fire Brigade, Fairfield Street, Manchester, 1. Tenders by March 31.

Newport, Mon.—Uniform, footwear, rain-coats, waterproof trousers, socks and caps for B.C. Documents from the Chief Fire Officer, Central Fire Station, Dock Street, Newport. Tenders by April 1.

***Staffordshire.**—Supply of uniform for Fire Brigade. Tenders by April 21.

DEMOLITION

Kids Grove, Staffs.—Demolition of certain houses which are subject to demolition

orders under the Housing Acts for U.D.C. Full information from the Chief Public Health Inspector, Town Hall, Kidsgrove. Tenders by April 11.

Watford, Herts.—Demolition and site clearance together with other ancillary works at 1-6, inclusive, Carey Place, for B.C. Applications to F. C. Sage, borough engineer and surveyor, Town Hall, Watford, by 2 p.m. March 29. Deposit £2 2s.

West Riding.—Demolition of six through cottages, 41 to 51 Bradford Road, Keighley, together with the erection of protective brickwork to the gable wall between 39 and 41 for C.C. Documents from the Divisional Architect, Salisbury Buildings, Albert Street, Harrogate. Tenders by April 24.

ELECTRICAL

Birmingham.—Electric lighting, power and heating installations in a tenants room (type 3) at each of the following estates for City Council: (Contract 719) Long Nuke Road; (744) Lakes Road. Documents from the office of Sir Herbert J. Manzoni, city engineer and surveyor, Civic Centre, Birmingham, 1. Deposit £2 2s. each contract, cheques payable to Sir Herbert J. Manzoni. Plans seen at the Mechanical and Public Lighting Department, 38 Cambridge Street, Birmingham. Tenders by April 5.

Bristol.—Improvements to electrical installations in pre-war dwellings for City Council. Written applications to Housing Manager, Council House, Bristol, 1, by March 27.

Cardiff.—Complete electrical re-wiring of 1,000 or part thereof, in various types of pre-war Council houses for City Council. Documents from the City Surveyor, City Hall, Cardiff. Deposit £2 2s., cheques payable to the Cardiff Corporation and crossed "Not Negotiable and Co." Tenders by March 30.

Coleraine, Londonderry.—Electrical installations in 22 dwellings at Claghagh, Kileara, for R.D.C. Documents from W. and M. Given, consulting engineers, 1 Waterside, Coleraine. Deposit £2 2s. Tenders by April 15.

Hull.—Electrical installation to 84 dwellings, Boothferry estate for City Council. Documents from G. R. Wright, deputy city architect, Guildhall, Hull. Deposit £2, to City Treasurer. Tenders by March 29.

Manchester.—Electrical installation to Whitebrook School for the Deaf, Followfield, for City Council. Documents from City Architect, P.O. Box 488, Town Hall. Tenders by April 10.

Manchester.—Electrical installation to shops and flats at Civic Centre, Wythenshawe, for City Council. Documents from City Architect, P.O. Box 488, Town Hall. Tenders by April 4.

Peterborough.—Electrical installation for a major extension of the technical college buildings, comprising a floor area of approximately 42,500 sq. ft. for the Joint Education Board. Applications to Leslie Tait, chief education officer, Education Offices, Town Hall, Peterborough, by noon, April 5. Deposit £2 2s., cheques payable to the Board.

Shannonbridge, Offaly, Eire.—Site development for a proposed power station at Shannonbridge for the Electricity Supply Board. The work includes the excavation and disposal of approximately 54,000 cu. yd. of subsoil and the construction of approximately 1,000 lin. yd. of station approach road. Documents from the Board's Chief Civil Engineer, Civil Works Department, 21 Lower Fitzwilliam Street, Dublin. Deposit £21. Additional copies of the contract documents may be obtained on payment of £3 3s., which will not be returnable. Tenders by March 31.

Swansea.—Electrical installation of rising mains and lateral services to (a) one 10-storey block of flats, Rheidol Avenue, Clase, and (b) one eight-storey block of flats, Heol Ffranc, Penlan, for The South Wales Electricity Board (Swansea district). Documents from the District Manager, Strand Offices, Swansea. Tenders by March 30.

Wandsworth.—B.C. invite applications from those who desire to have their names placed on the Council's list of electrical contractors who may be invited to submit quotations or tenders from time to time for the execution of electrical installation works. Applications by letter, giving names of two technical and one financial referee, to J. Noel Martin, town clerk, Municipal Buildings, Wandsworth, S.W.18, by March 30.

FENCING

Luton, Beds.—Renewal of chain link fencing at Leagrave Junior School for B.C. Documents from Borough Architect, Town Hall, Luton. Tenders by April 4.

GAS AND WATER SUPPLY

Amphill, Beds.—Laying of water mains as follows, for R.D.C.: 96yd. 3in. diameter a.c. mains, Water Lane, Flitwick; 143yd. 3in. diameter a.c. mains, Newbury Lane, Silsoe. Documents from the Engineer and Surveyor.

The Limes, 12 Dunstable Street, Amptill, Bedford. Deposit £2 2s. Tenders by April 18.

Angus.—Lintrathen water scheme (contract 8) for C.C., comprising supplying and laying seven miles of 4in., 3in. and 2in. a.c. pipes, with construction of 50,000-gallon and 10,000-gallon r.c. reservoirs. Apply to the County Engineer, County Buildings, Forfar, by March 27.

Angus.—Loch Lee water scheme, first phase (contracts 6/3, 7/2 and 10/2) for C.C., which comprise the construction of three 150,000-gallon reinforced concrete storage tanks. Apply to the County Engineer, County Buildings, Forfar, by March 27.

Barrow-in-Furness, Lancs.—Supply and erection of pumping plant at Sandgate pumping station, contract 1, for B.C. Deposit £2 2s. Tenders by April 10.

Berwick-upon-Tweed, Northumb.—Water supply to area of borough north of the River Tweed for B.C., comprising the laying of about 14,250 lin. yd. of 9in., 6in., 4in. and 3in. spun-iron water mains, complete with valves, etc.; the construction of a reinforced concrete reservoir of 250,000 gallons capacity; a reinforced concrete storage tank of 40,000 gallons capacity; two booster stations, and other appurtenant works. Send names and addresses to D. Balfour and Sons, consulting engineers, Caledonian Buildings, 145 Pilgrim Street, Newcastle upon Tyne, 1, by April 7. Deposit £5, payable to Council.

Bridgwater, Som.—Construction and maintenance for a period of 12 months of a circular reinforced concrete reservoir of 100,000 gallons capacity and having poststressed walls, together with pipe connections, float valve chamber, and other incidental works, at Puriton, near Bridgwater, for R.D.C. Documents from Lemon and Blizard, consulting engineers, 59 Tufton Street, Westminster, S.W.1. Deposit £5 5s. cheque, payable to Council. Tenderers may also obtain a set of plans from the Consulting Engineers by separate payment of 30s. by cheque made payable to Lemon and Blizard (not refunded). Plans may be inspected free of charge on and after March 27 at all reasonable hours at the offices of the consulting engineers and at the office of the Council's Engineer, Council Offices, The Priory, St. Mary Street, Bridgwater. Tenders by April 17.

Cardiff.—Laying water main from St. Lythans reservoir to Aberthaw power station for City Council. Deposit £2 2s. Tenders by April 12.

Devonshire.—Construction of a 30,000-gallon reinforced concrete water tower near East Prawle Village, about nine miles from Kingsbridge for the South Devon Water Board. The circular water tower is 27ft. in diameter with 9in. thick 13ft. high walls and with its base about 28ft. above ground level. Documents from the Board's Engineer at Churston House, Kingsbridge. Tenders by April 26.

Dorchester, Dorset.—Construction of a borehole for B.C. Deposit £2 2s. Tenders by April 8.

Durham.—Supply of chemical dosing pumps and/or lime mixing tanks for Waskerley for the County Water Board. Documents from A. C. Wildsmith, chief engineer, Neville Court, Durham. Tenders by April 4.

Ghana.—Purification and pumping plant for Axim water supply scheme for the Ghana Supply Commission. Refer to our issue of March 16, page 1417.

Huntingdon.—Water supply to farms at the Giddings for R.D.C. Deposit £2 2s. Tenders by April 19.

Mayo, Eire.—Construction of a water supply scheme in the village of Mulranny for C.C. Documents from Patrick J. Tobin, consulting engineer, 22 Eyre Square, Galway. Deposit £30. Tenders by April 21 (extension of date).

Mayo, Eire.—Provision and installation of a complete rapid gravity filtration system in the proposed regional water supply scheme for Lower Achill Island, for C.C. Documents from Patrick J. Tobin, consulting engineer, 22 Eyre Square, Galway. Deposit £10. Tenders by May 20.

Mayo, Eire.—Construction of a regional water supply scheme to serve the villages of Doagh, Pollagh, Keel, River and Dookinella, in Lower Achill Island for C.C. The scheme includes intake works at Lough Accormore, aeration tanks, sedimentation tanks and a rapid gravity filtration works near Doagh, a clear water tank and balancing tank, each of 100,440 gallons capacity, four small service reservoirs of capacity varying from 25,000 gallons to 10,000 gallons capacity, and 16 miles of pipelines varying from 8in. to 3in. diameter. Documents from Patrick J. Tobin, consulting engineer, 22 Eyre Square, Galway. Deposit £50. Tenders by May 6 (extension of date).

Middlesbrough, Yorks.—The laying of 3,632yd. of 21in. diameter spun-iron main between Brambles Farm (Spencer Beck) and I.C.I. Wilton (West Gate) (contract 125) for Tees Valley and Cleveland Water Board.

Work must commence by mid-May, 1961, and be completed by Dec. 31, 1961. Applications in writing to T. S. R. Winter, engineer, New Works, etc., The Tees Valley and Cleveland Water Board, Corporation Road, Middlesbrough. Only contractors thoroughly experienced in such class of work should apply. Tenderers are required to indicate what previous work in this class they have carried out, and in its consideration of the tenders, the Board will pay due attention to such experience. Deposit £3 3s., cheques payable to the Board. Tenders by April 10.

Newry, Armagh.—Comprehensive water scheme, section 4, for R.D.C., including the supply and laying of the following approximate lengths of flexible jointed water mains: 4,050 lin. yd. of 8in. s.i. class B pipes; 418 lin. yd. of 8in. s.i. class C pipes; 3,950 lin. yd. of 8in. a.c. class B pipes; 2,008 lin. yd. of 8in. a.c. class C pipes; 1,472 lin. yd. of 8in. a.c. class D pipes; 1,660 lin. yd. of 3in. s.i. class C pipes; 917 lin. yd. of 2in. a.c. class C pipes, and incidental works thereto, together with the construction of a 250,000 gallons capacity reinforced concrete reservoir and ancillary site works. Documents from Nicholas O'Dwyer, Son and Partners, consulting engineers, 6 Trevor Hill, Newry, Co. Down. Deposit £15 15s. Tenders by April 13.

Newry, Armagh.—Comprehensive water scheme, zone 3, for R.D.C. Deposit £5 5s. Tenders by May 2.

Richmond, Yorks.—Laying of approximately 2,950yd. of 4in. and approximately 18,250yd. of 3in. diameter spun-iron main, including valves, hydrants and other fittings at Barton for R.D.C. Documents from J. T. Powell, engineer and surveyor, Swale House, Richmond. Deposit £2. Tenders by April 10.

Shropshire.—Laying water mains to serve Broseley for the East Shropshire Water Board. Deposit £3 3s. Tenders by May 5.

Wales.—Laying of 1in. and 1½in. diameter mild steel gas services to dwellings in course of construction on housing sites within the area of supply of the Swansea and Pontardulais undertakings for the Wales Gas Board. Documents from A. Pickard, general manager and engineer, Wales Gas Board (Swansea undertaking), Kingsway, Swansea. Tenders by March 31.

HEATING AND VENTILATING

Belfast.—L.p.h.w. heating, hot and cold water and steam soil sterilising installations at Entomology Building, Whitewell, for the Ministry of Finance. Documents from Room 103, Law Courts Building, Belfast, 1. Tenders by April 13.

Birmingham.—Conversion to oil-firing and for the modification of the heating system at Highgate Road Garage for City Council. Particulars from W. H. Smith, general manager, Birmingham City Transport, The Council House, Congreve Street, Birmingham. 3. Tenders by April 6.

Bristol.—Installation of hot water systems in certain post-war dwellings for City Council. Written applications to Housing Manager, Council House, Bristol, 1, by March 27.

Cardiff.—Installation of heating and allied services at the proposed county primary school, Pentreban Road, Fairwater, for City Council. Documents from the City Surveyor, City Hall, Cardiff. Deposit £2 2s., cheques payable to the Cardiff Corporation and crossed "Not Negotiable and Co." Tenders by April 13.

Luton, Beds.—New boiler installation at Maidenhall Primary School, for B.C. Documents from Borough Architect, Town Hall, Luton. Tenders by April 4.

Peterborough.—Heating and domestic hot and cold water services for a major extension of the technical college buildings, comprising a floor area of approximately 42,500 sq. ft. for the Joint Education Board. Submit names and particulars to Leslie Tait, chief education officer, Education Offices, Town Hall, Peterborough by noon, April 5. Deposit £2 2s., cheques payable to the Board.

Scotland.—Supply and installation of boiler plant and associated equipment for P.O.L. storage depot in Campbelltown area for N.A.T.O. Refer to our issue of March 16, page 1407.

HOUSING SCHEMES

Barrowford, Lancs.—Following works in The Square for U.D.C.: (a) The erection of 20 two-storey flats in three blocks, together with site works; (b) the construction of roads and sewers; (c) the demolition of 15 houses. Documents from the Engineer and Surveyor, Council Offices, Halstead Lane, Barrowford. Deposit £2 2s. each for (a) and (b) and £1 1s. for (c). Tenders by April 10.

Belfast.—Twelve houses and play-centre at St. Leonards Street for City Council. Documents from the City Architect's Department, Housing Section, 97 Townsend Street, Belfast, 13. Deposit £5 5s., cheques payable to Belfast Corporation. Tenders by April 4.

Burton-on-Trent, Staffs.—Fifty dwellings and 14 garages for B.C. Deposit £2 2s. Tenders by May 5.

Cardigan.—Twenty two-bedroom bungalows at Maesglas housing estate for B.C. Documents from the Borough Surveyor, Guildhall, Cardigan. Deposit £2 2s. Tenders by April 5.

Chatham, Kent.—Twelve flats at Derry Street for B.C. Deposit £2 2s. Tenders by April 7.

Dumbarton.—Fifty-seven houses of traditional construction at Barrwood Hill for B.C. Applications to the Town Clerk, Municipal Buildings, Dumbarton, by March 31.

Essex.—Following police houses for C.C.: Harlow—four pairs of houses, each pair sited separately, estimated cost £18,700; Chelmsford, Springfield Road and Peel Road—four pairs of houses, estimated cost £18,700; Mistley—one pair with office and mess room, estimated cost £6,300. Applications to H. Conolly, county architect, County Hall, Chelmsford, by March 25.

Larne, Antrim.—Forty-four dwellings and 10 garages and construction of site works and main services at Cloney, Glenarm, for R.D.C. Documents from T. F. W. Nelson, clerk of the Council, Princes Gardens, Larne. Tenders by April 12.

Limavady, Londonderry.—Two hundred and forty-eight dwelling houses in Limavady with ancillary works of an approximate value of £400,000 for U.D.C. Building contractors who have carried out contracts on a similar scale and wish to be included on a list of firms to be invited to tender should submit their names for consideration in being placed on the tender list to W. L. Irwin, clerk of the Council, Town Hall, Limavady, by March 25.

Liverpool.—Twenty flats at Karonga Way for City Council. Documents from City Architect and Director of Housing, Blackburn Chambers, Dale Street, Kingsway, Liverpool, 2. Deposit £2 2s., payable to City Treasurer. Tenders by April 6.

Lutterworth, War.—Twelve bungalows on land at Baker Street for R.D.C. Documents from A. F. Ashton, clerk of the Council, Woodmarket, Lutterworth, Rugby. Tenders by April 5.

Magherafelt, Londonderry.—(1) Twelve dwellings at Glenone, Portlengone; (2) 6 dwellings at Creagh, Toomebridge. Documents from W. and M. Given, architects and consulting engineers, 1 Waterside, Coleraine, and W. J. McKinney, clerk to Council, Council Offices, Magherafelt. Deposit £3 3s. per set. Tenders by March 30.

Nairn.—One block of two four-apartment houses at Albert Street for the Scottish North-Eastern Counties Police Board: (1) Excavator, mason, concrete and roughcast works; (2) carpenter and joiner works; (3) slater work; (4) plumber work; (5) plaster work; (6) electric work; (7) painter and glazier works; (8) supply of grates. Documents from the County Architect, County Buildings, Elgin. Contractors are requested to indicate clearly the works for which they wish to tender. Tenders by April 11.

Newtown, Monts.—Two police houses at Lower Canal Road for the Mid-Wales Police Authority. Documents from P. E. White, clerk to the Mid-Wales Police Authority, County Offices, Welshpool. Tenders by April 10.

Northern Ireland.—Thirty-two dwellings and ancillary works at Camross Park, Rathcoole, for Housing Trust. Documents from the Offices of the Trust, 12 Hope Street, Belfast. Deposit £3. Tenders by April 8.

Northfleet, Kent.—Twenty-four houses (traditional brick construction) on the Painters Ash estate for U.D.C. Documents from the Engineer and Surveyor, Town Hall, Northfleet. Deposit £2 2s. Tenders by April 10.

Oban, Argyll.—One hundred and sixty-two houses and flats and two shops at Corran Brae housing development 2 for B.C. Apply in writing to Morham and Brochie, quantity surveyors, 2 Shore Street, Oban. Tenders by April 24.

Totnes, Devon.—Two pairs of semi-detached bungalows at Moor Road, Staverton, together with incidental works and services for R.D.C. Documents from the Engineer and Surveyor, Council Offices, Plymouth Road, Totnes. Deposit £2 2s. Tenders by April 20.

Walsall, Staffs.—Digbeth High Street redevelopment for B.C. Deposit £2 2s. Tenders by April 24.

Wandsworth.—Three hundred and eight dwellings at Beaumont Road, Southfields, for B.C. Submit names by April 5.

Wigan, Lancs.—Forty-three dwellings at Drummund Square site for B.C. Deposit £2 2s. Tenders by April 14.

Wycombe, Bucks.—Two aged persons' bungalows, Coppie Farm Road, Tylers Green, for R.D.C. Documents from the Engineer and Surveyor, 8-9 Easton Street, High Wycombe. Tenders by April 8.

MATERIALS AND SUPPLIES

Bedlington, Northumb.—Supply of the following materials, etc., for the 12 months ending March 31, 1962, for U.D.C.: G/6/61 iron castings; G/7/61 tools; H/2/61 doors; H/5/61 Deal windows; H/6/61 timber; H/7/61 fireplaces; H/8/61 cast-iron rainwater goods; H/9/61 conex fittings; H/10/61 sanitary goods; H/12/61 electrical goods; H/13/61 plaster and plaster baseboard; H/15/61 interlocking roofing tiles; H/15A/61 plain roofing tiles; H/16/61 bituminous roofing felt and D.P.C.; H/17/61 copper tube. Documents from A. K. Dennis, engineer and surveyor, Council Offices, Bedlington. Tenders by April 21.

Belfast.—Supply of the following materials to the Gas Department for City Council: Brass and copper fittings, etc.; casks, drums, etc.; cast-iron pipes and fittings; compo pipe; firebricks for water gas plant; firebricks for vertical retorts; gas lamps and fittings; gas mantles; iron castings; mill furnishings; purifier grids; rack and pinion valves; service tubes and fittings; spare parts for vertical retorts; sulphuric acid. Documents from the Gas Works, Ormeau Road, Belfast. Tenders by April 13.

Dungannon, Tyrone.—Timber, hardware, plumbing materials and miscellaneous stores for the year ending March 31, 1962, for R.D.C. Documents from the Engineer, Rural District Council Offices, Dungannon. Tenders by April 10.

Durham.—Supply of modelling equipment, etc., for Consett Technical College, for C.C. Tenders by March 31.

Flintshire.—Supply of the following for C.C.: (a) Fire Service uniform, including footwear, shirts, etc.; (b) 4,500ft. of 2½in. lined delivery hose in 75ft. lengths; (c) 60 pairs of 2½in. light alloy polished and anodised instantaneous couplings, with 2½in. tails; (d) four dry powder extinguishers of 25/30lb. capacity; (e) two open circuit compressed air breathing sets; (f) one electrical compressor for charging 5A cylinders; (g) 10 jet/spray branch pipes; (h) 20 salvage sheets. Documents from the Chief Fire Officer, Fire Service Headquarters, Coast Road, Rhyl. Tenders by April 22.

Glasgow.—Jobbing works, cartage and materials required for the year commencing June 1, 1961, as follows for City Council—Jobbing works and cartage: (1) Motor haulage; (2) smithwork; (3) tarspraying works. Materials: (4) Ashes; (5) bricks; (6) cement; (7) cotton waste, dusts, etc.; (8) fireclay goods; (9) granite chips and crushed granite; (10) ironmongery; (11) rock limestone chips; (12) cast-iron manhole frames and covers (triangular type); (13) oils; (14) filled pitch, pitch oil, tar bitumen mixture and emulsified bitumen; (15) sand; (16) shafts and handles; (17) clean metal chips and tarmacadam; (18) bitumen macadam, fine cold asphalt and bituminous fines; (19) win kerbstones; (20) lime (for sewage purification); (21) ropes and twines; (22) sulphate of alumina (for sewage purification). Documents from the Offices of Public Works (Room 81), City Chambers. Tenders by April 4.

Hucknall, Notts.—Supply of waiting restriction signs, etc., for U.D.C. Documents from the Surveyor, Council Offices, Hucknall. Tenders by April 18.

Manchester.—Supply of 800 galvanised steel refuse containers, about 4½ cu. ft. capacity, for City Council. Documents from the Director of Public Cleansing, Town Hall, Manchester, 2. Tenders by April 4.

North Down.—Supply of P.V.C. pipes for R.D.C. Documents from the Council Offices, 2 Church Street, Newtownards. Tenders by March 31.

Salford, Lancs.—Supply of the following materials during the period July 1, 1961, to June 30, 1962, for City Council: (1) Electric lamps; (2) electric cables. Documents from the Street Lighting Superintendent, 9 Frederick Road, Pendleton, Salford, 6. Tenders by April 4.

Welwyn Garden City, Herts.—Following materials for U.D.C.: (a) One hundred tiled surrounds; (b) 100 back boiler units; (c) 100 Finch throat units. Documents from the Housing Manager, Council Offices, Welwyn Garden City. Tenders by April 6.

MISCELLANEOUS

Manchester.—Supply and installation of dust extraction plant at: (a) Mount Road cleansing depot; (b) Russell Road cleansing depot for City Council. Documents from City Architect, P.O. Box 488, Town Hall. Tenders by April 7.

PLANT AND MECHANICAL TRANSPORT

Basildon, Essex.—Supply of all or any of the following for U.D.C.: Two Bedford 3-ton lorries; two Fordson 5cwt. vans; one Fordson 10-12cwt. van; one Fordson 15cwt. pick-up truck; one Fordson 15cwt. with 3 cu. yd. Eagle refuse body; four Fordson Dexta or

Ferguson FE 35 tractors; one hydraulic loading shovel for Fordson Major diesel tractor. Documents from the Engineer and Surveyor, Council Offices, 88 Town Square, Basildon. Tenders by March 29.

Basildon, Essex.—Supply of all or any of the following for U.D.C.: Six Ransomes 18in. motor mowers; two Ransomes hand mowers; two Ransomes multimowers; one Ransomes verge cutter; one Ransomes triple unit Sportcutter gang mower with two spare units; two Ransomes quintuple Sportcutter gang mowers; four 5cwt. 24in. hand rollers; one Sisis 10cwt. motor roller; one Pattisson light golf harrow; one Pattisson spiked harrow. Documents from Engineer and Surveyor, Council Offices, 88 Town Square, Basildon. Tenders by March 29.

Bexley, Kent.—Supply of the following for B.C.: Five 20in. Atco side-wheel motor mowers (four-stroke engine); two 36in. Dennis motor mowers and accessories; two J.P. super Mk. IV, fitted with seven-blade multi-cut unit; one Allen self-propelled motor scythe, model TS (four-stroke engine); one Howard-Clifford Gem IV series Rotavator. Tenderers must be willing to take old plant in part exchange. Documents from the Parks Superintendent, The Mansion, Danson Park, Bexleyheath. Tenders by March 27.

Birkenhead, Ches.—Supply of one Bedford C.L.A. 110in. wheel base van fitted with Perkins four 99 diesel engine, and the purchase of a 1954 Bedford 30-cwt. van which may be taken in part exchange for B.C. Documents from the Chief Fire Officer, Fire Brigade Headquarters, Whetstone Lane, Birkenhead. Tenders by March 29.

Bury, Lancs.—Following for B.C.: Supply of a 3-ton Ferguson trailer, complete with hydraulic tipping device and ring hitch, and two Shanks model 10 gang units to make existing triple into quintuple set. Parts required—one standard unit, one offset unit and one frame. Documents from Recreation Grounds Superintendent, The Cemetery, St. Peter's Road, Bury. Tenders by April 4.

Canvey Island, Essex.—Supply of following for U.D.C.: One Ford 4-ton Thames 157in. wheelbase chassis and cab, fitted with 4-cylinder diesel engine complete to maker's current specification, a Tuke and Bell, Ltd. 10 cu. yd. refuse collection body with stabiliser, and bench type seat to accommodate the driver and two loaders, Firestone all traction tyres on rear wheels, licence holder and number plates, flasher indicators complete with switch and wiring. The tender figure also to include painting and sign-writing, delivery fuel and oil. Tenders quoting delivery date to J. Rumble, clerk of the Council, Council Offices, Long Road, Canvey Island, by March 31.

Chapel-en-le-Frith, Derbys.—Supply of a diesel-engined tractor to the Council Offices for R.D.C. Documents from the Engineer and Surveyor, Council Offices, Chapel-en-le-Frith. Tenders by April 7.

Cookstown, Tyrone.—Supply of one 250-gallon flapper type tarspraying machine on solid rubber tyres and complete with all fittings and the addition of handspraying apparatus including 15ft. of ¾in. bore armoured rubber hose for U.D.C. The boiler is to be either coal or coke fired and the tender shall include for the provision of a spring draw bar, thermometer, barrel rests, hoisting tackle comprising of tubular steel jib crane, winch, wire rope and barrel slings, etc. Further particulars from C. G. Birtwell, town surveyor, Town Hall, 7 Burn Road, Cookstown. Tenders by April 4.

Flintshire.—Supply of the following for C.C.: (a) One Commer type B water tender or Home Office specification JCDD/3/1 (revised January, 1958, and June 1960); (b) one mobile workshop van; (c) one 10cwt. van. For delivery before March 31, 1962. Documents from the Chief Fire Officer, Fire Service Headquarters, Coast Road, Rhyl. Tenders by April 22.

Forehoe and Henstead, Norfolk.—Supply of the following for R.D.C.: One cesspool emptying vehicle of 800-gallon capacity, with night soil attachment; one Ford Thames 15cwt., chassis and cab, with drossides and tail open truck. Details from R. F. Blazey, clerk of the Council, Council Offices, Ber House, 158 Ber Street, Norwich.

Irvinestown, Fermanagh.—Supply of a refuse collection vehicle of 10/12 cu. yd. capacity fitted with a steel body, hydraulically operated dual tipping gear with twin tyres at rear for R.D.C. The price must include for painting and lettering according to the Council's requirements and those persons tendering are requested to submit a trade-in price for the Council's present vehicle, which may be inspected by arrangement at the Council Offices. The lowest or any tender may not necessarily be accepted. Tenders in sealed envelopes endorsed "Refuse Vehicle" and accompanied by a full specification of the vehicle offered and the probable date of

delivery to P. M. Tumath, clerk of Council, Council Offices, Irvinestown, by 4 p.m. April 4.

Litherland, Lancs.—Supply of following for U.D.C.: (1) One light roller within the range of 2/3 tons; (2) one S.W.B. tipping lorry within the range of 3/5 tons. Documents from the Engineer and Surveyor, Town Hall, Litherland. Tenders by March 30.

Manchester.—Following for City Council. Supply to Great Harwood, Lancashire, of one articulated vehicle comprising: (a) Tractor unit (diesel); (b) semi-trailer, 10-ton laden, 24/25ft. long with drop sides, automatic coupling and fifth wheel. In grey primer finish only. Tender documents will not be issued and tenderers should submit full specifications of the vehicle, etc., offered and include alternative prices for normal and forward control. The earliest delivery available should be stated. Tenders enclosed in sealed envelopes endorsed "Tender for Articulated Vehicle" and addressed to the Chairman of the Waterworks Committee, Town Hall, Manchester, 2, by 10 a.m. April 5.

Manchester.—Supply of the following for City Council: (a) One angledozer and scraper; (b) one angledozer; (c) one tractor; (d) three semi-dump vehicles, 8/9-ton; (e) one breakdown vehicle. Documents from Director of Public Cleansing, Town Hall, Manchester, 2. Tenders by April 4.

Marshalland, Norfolk.—Supply of one crawler type tractor fitted with front-mounted loader and rear-mounted back hoe type excavator and one low-loader for the above tractor for R.D.C. (Wisbech and Marshalland Joint Refuse Disposal Committee). Further particulars from the Borough Engineer, Church Terrace, Wisbech. Tenders by April 15.

Monmouthshire.—Hire of plant for the Usk River Board. Tenders by April 10.

Peterborough.—Supply the following items of new plant for C.C.: (a) One Ford Thames 4D lorry, alternatively, one Ford Thames Trader 5 ton 108in. wheel base (six cylinder diesel) lorry; (b) one Hayter Highway rotary grass cutter. Documents for any of the items from County Surveyor, County Offices, Bridge Street, Peterborough. Tenders by April 17.

Tipperary, Eire.—Supply of the following to the Machinery Yard, Clonmel, for C.C.: (a) Light trailer fire pump, capacity 250/350 g.p.m., pump should be dismountable and its weight (dry) should not exceed 4cwt., the unit should be finished in red and price should include for lettering in white; (b) four 8ft. lengths 4in. diameter armoured suction hoses, complete with couplings and spanners, and one 4in. R.T. metal strainer, with basket; (c) one only 4in. x two-way suction collecting head, with 2½in. fittings. The Council does not bind itself to accept the lowest or any tender. Sealed tenders, with full particulars and indicating delivery date, marked "Tender for Fire Brigade Equipment." The Secretary, County Council Offices, Clonmel, by 5 p.m. April 6.

Wisbech, I. of E.—Following for B.C.: (a) 750/800-gallon cesspool and gully emptier; (b) diesel-engined agricultural type tractor; (c) 27/30cwt. tandem vibrating roller. Further particulars from the Borough Engineer, Church Terrace, Wisbech. Tenders by April 1.

Wrexham, Denbighs.—Supply and delivery of one Aveling-Barford calldozer, fitted with diesel engine and hydraulic hoist for 4ft. 6in. blade, generally as described in Aveling-Barford Ltd.'s leaflet No. 1788 and painted in deep orange to B.S.C. No. 591. Tenders, giving full particulars of the calldozer, should be delivered in envelopes endorsed "Calldozer," to Trevor L. Williams, clerk of the Council, Imperial Buildings, Regent Street, Wrexham, by noon, April 4.

PLAYING FIELDS, PARKS, ETC.

Argyllshire.—Construction of an extension to the existing burial ground at Carsaig (Tayvallich) for C.C. The work consists of the erection of fences and gate, the construction of pathways, and layout of lairs, etc. Applications to the County Engineer, Lochgilphead, by March 29.

Brierley Hill, Staffs.—Construction of a 440yd. running track, together with approximately 6½ acres of soiling and seeding, approximately 3,500 lin. yd. of 2in. to 6in. diameter land drains and other incidental works at the Dell Recreation Ground for U.D.C. Documents from the office of the Engineer and Surveyor, Civic Buildings, Brierley Hill. Deposit £3 3s. Tenders by April 6.

Gateshead, Dur.—Regrading, etc., and seeding of two football pitches at Moss Heap Quarries recreation ground for B.C. Documents from the Borough Engineer, Municipal Buildings, Swinburne Street, Gateshead, 8. Deposit £2 2s., cheque payable to Borough Treasurer. Tenders by April 10.

ROADS, BRIDGES AND SITE WORKS

Alton, Hants.—Construction of approximately 5,000 sq. yd. of flexible carriageways, drainage and other appurtenant works at Manor estate, stage 2, for U.D.C. Documents from F. T. Cornhill, engineer and surveyor, Council Offices, High Street, Alton. Tenders by April 7.

Barking, Essex.—Reconstruction of Ripple Road (part) for B.C. Tenders by April 11.

Bath, Som.—Making-up of Haviland Grove for City Council. Deposit £2 2s. Tenders by April 5.

Beddington and Wallington, Surrey.—Excavation, pitched foundation, laying of tarmacadam base course, D.T.C. surfacing and incidental works of reconstruction of public car park for 142 cars adjoining Wallington Town Hall for B.C. Documents from Borough Engineer, Town Hall, Wallington, Surrey. Tenders by April 28.

Beverly, Yorks.—Construction of approximately 840 sq. yd. of concrete carriageway and 180 lin. yd. of 6 in. and 9 in. sewers at Shopthorpe Way, Woodmansey (Contract 444) for R.D.C. Documents from G. Palfreyman, engineer and surveyor, 22 Laigate, Beverley. Deposit £1, cheques payable to Council. Tenders by April 18.

Chadderton, Lancs.—Surface dressing of various roads for U.D.C. Tenders by April 7.

Cheadle and Gatley, Ches.—Making-up of each of the following streets for U.D.C.: Vaudrey Drive, Cheadle Hulme; Croft Road, Cheadle Hulme; Lorna Road, Cheadle Hulme; Grange Park Road, Cheadle; Grange Park Avenue, Cheadle; Crescent Road, Cheadle; Crescent Grove, Cheadle; Hall Grove, Cheadle; Cuthbert Road, Cheadle; Adshall Road, Cheadle; Calverley Road, Cheadle; Oakwood Avenue, Gatley. Documents from the Engineer and Surveyor, Town Hall, Cheadle. Deposit £2 2s. Tenders by April 12.

Cheshunt, Herts.—Making-up of Maybury Avenue, length 205yd. (Contract 382) for U.D.C. Documents from the Engineer and Surveyor, Manor House, Cheshunt. Deposit £2. Tenders by April 6.

Coalville, Leics.—Surface dressing of roads (96,000 sq. yd.) for U.D.C. Documents from Engineer and Surveyor, Municipal Offices, Coalville. Tenders by April 17.

Cornwall.—Construction of two bridges at Heskyn, on the Trerulefoot-Saltash Road, A.374, for C.C.: (a) A road bridge, span 15ft. x 18ft. above the road; and (b) a river bridge of box section 20ft. span x 10ft. above the river bed. The river must be diverted during the construction of the river bridge, and arrangements to do so are included in the contract. It is important that the works are finished as soon as possible, and persons tendering are to state how soon after receiving notification that their tender is accepted, they will complete the two bridges. The filling over the bridges is not included in the contract, the County Council will provide and consolidate all filling as required. Documents from County Surveyor, County Hall, Truro. Deposit £5. Tenders by April 10.

Couldson and Purley, Surrey.—Cold asphalt surfacing and ancillary works for U.D.C. Deposit £3 3s. Tenders by April 4.

Dundee, Angus.—Surface dressing of approximately 200,000 sq. yd. of carriageways for City Council. Documents from the City Engineer, 21 City Square, Dundee. Tenders by April 12.

Edinburgh.—Asphalt paving works, phase 1, 1961-62, for City Council. Documents from City Engineer, 329 High Street. Tenders by April 10.

Esher, Surrey.—Laying of hardcore and clinker roadways on allotment sites, contract 314, for U.D.C. Deposit £1 1s. Tenders by April 11.

Eston, Yorks.—Construction of approximately 4,000 sq. yd. of concrete flagged footpath, together with appurtenant works, on the Grangetown estate, section 1, for U.D.C. Documents from the Engineer and Surveyor, 246 Normanby Road, South Bank, Middlesbrough. Deposit £2. Tenders by April 12.

Failsforth, Lancs.—Construction of approximately 900 lin. yd. of sewers from 6 in. to 12 in. diameter earthenware pipes, 8,105 super. yd. of roadworks and formation of playing field, together with all other incidental works at Mabel Road for U.D.C. Documents from the Engineer and Surveyor, Town Hall, Failsforth. Deposit £3 3s. Tenders by April 14.

Heanor, Derbys.—Supplying and laying of approximately 1,000 tons of bituminous granite and also supplying and laying of fine cold asphalt with ½ in. precoated granite chippings rolled in over approximate area of 21,000 super. yd. for U.D.C. Documents from the Engineer and Surveyor, Council Offices, Heanor. Tenders by April 10.

Heanor, Derbys.—Surface dressing of approximately 71,000 sq. yd. with refined tar

and slag chippings for U.D.C. Documents from the Engineer and Surveyor, Council Offices, Heanor. Tenders by April 10.

Herefordshire.—Improvement of the Newport-Worcester Trunk Road between Preston Cross and The Stocking for C.C. Deposit £5 5s. Tenders by April 21.

Hertfordshire.—Making-up Elmwood Avenue and Oakwood Avenue, Boreham Wood, for C.C. Elmwood Avenue is 124yd. long with 20ft. carriageway, 6ft. footways and 4ft. verges. The work includes new hardcore foundations to ends of existing carriageway, surfacing with tarmacadam, provision of kerbing, construction of bituminous macadam footways and crossings, and the provision of verges, new surface water gullies and connections. Oakwood Avenue is 180yd. long with 26ft. carriageway, 7ft. footways. The work includes scarifying part of and resurfacing existing tarmacadam carriageway, taking-up and re-laying existing precast concrete paving slabs to footways, breaking-out and re-laying concrete crossings to footways. Documents from the County Surveyor's Department, County Hall, Hertford, and drawings seen by appointment. Tenders by April 12.

High Wycombe, Bucks.—Making-up of footpaths with tarmacadam surfacing, concrete edging and grass verges, etc., on the Hicks Farm housing estate (approximately 7,000 sq. yd. total area) for B.C. Documents from the Borough Engineer's Department, Municipal Offices, High Wycombe. Deposit £2 2s. Drawings seen at Borough Engineer's Department, between 9 a.m. and 5 p.m. daily (Saturdays excepted). Tenders by March 30.

Kendal, Westmor.—Roads and sewers at Sandyland housing estate contract 2, for B.C. Deposit £2 2s. Tenders by April 20.

Kettering, Northants.—Construction of access road and storm water culvert at Pychley Road industrial site for B.C., comprising 3,300 sq. yd. of pitched carriageway with dense tar surfacing, 1,680 sq. yd. of tarmacadam paving to footways, 880 lin. yd. of 6 in. and 9 in. foul and surface water sewers, 80 lin. yd. of 72 in. diameter pipe culvert, earthworks and incidental work. Documents from H. G. Perry, borough engineer and surveyor, 3 Gold Street, Kettering. Deposit £3 3s. Tenders by April 8.

Lancashire.—Aerial survey for a proposed road in east Lancashire, length approximately four miles for C.C. Documents from the County Surveyor, P.O. Box 9, Preston. Tenders by March 29.

Larne, Antrim.—Extension to cemetery at Ballyharry, Islandmagee, including the erection of a combined shelter and toilet block for R.D.C. Documents from T. F. W. Nelson, clerk of the Council, Prince's Gardens, Larne. Tenders by April 12.

Lewes, Sussex.—Construction of roads and sewers for B.C. Application by March 31.

Limavady, Londonderry.—Widening and re-aligning of Rathmore Road and Church Street for U.D.C. The works include excavation to the road formation level, foundations in hardcore, surface water drainage, the laying of kerbing and footpaths, with finished road surface in bituminous macadam. Documents from the Town Surveyor, Town Hall, Limavady. Deposit £5. Tenders by March 30.

Liverpool.—Resurfacing playground with bituminous macadam. Barlow's Lane County Primary School for City Council. Documents from City Engineer and Surveyor, Municipal Buildings, Liverpool, 2. Tenders by April 6.

Long Eaton, Derbys.—Private street works at Austen Avenue for U.D.C., including 150 lin. yd. of 16ft. wide carriageway with stone foundation and bituminous macadam surfacing, together with footpath paving, kerbs, channels and laying of 9 in. diameter surface water sewer. Documents from Francis Turner, engineer and surveyor, Town Hall, Long Eaton. Tenders by April 9.

Morecambe and Heysham, Lancs.—Surfacing with ½ in. hot rolled asphalt of approximately 11,300 sq. yd. of carriageway within the borough for B.C. Documents from the Borough Engineer and Surveyor, Town Hall, Morecambe and Heysham. Tenders by March 30.

Morecambe and Heysham, Lancs.—Heating and planing of approximately 16,200 sq. yd. of carriageway within the borough for B.C. Documents from the Borough Engineer and Surveyor, Town Hall, Morecambe and Heysham. Tenders by March 30.

Newcastle-under-Lyme, Staffs.—Making-up of Rathbone Avenue, May Bank, for B.C. Tenders by April 6.

Potters Bar, Middx.—Following for U.D.C.: (a) Reconstruction of approximately 2,570 sq. yd. of tarmacadam footway in Manor Road, together with all other incidental work; (b) reconstruction of approximately 2,250 sq. yd. of tarmacadam footway and the

breaking-up of the existing concrete carriageway and reconstruction in tarmacadam approximately 2,580 sq. yd. in Billy Lows Lane, together with all other incidental work. Documents from the office of the Engineer and Surveyor, Wyllyotts Manor, Darkes Lane, Potters Bar. Deposit £2 2s. Tenders by April 6.

Prescot, Lancs.—Surface dressing for U.D.C. Tenders by April 12.

Reigate, Surrey.—Making-up private street at Redstone Manor, Redhill, including 477 lin. yd. kerbing, 1,660 super. yd. tarmacadam surfacing for B.C. Documents from Borough Surveyor, Town Hall, Reigate. Tenders by April 1.

Rugby, War.—External services work at site of proposed depot, Bilton Lane, Dunchurch, for R.D.C., involving provision of surface water drainage, water main, concrete road, etc., Documents from the Surveyor, 16 Warwick Street, Rugby. Tenders by April 11.

Salford, Lancs.—Following for City Council: (1) Making-up and completing Osborne Road, Salford, 6; (2) 7,100 tons (approximately) rolled asphalt (hot process); (3) 60,000 sq. yd. (approximately) surface dressing. Documents from City Engineer and Surveyor, Town Hall, Salford, 3. Tenders by April 5.

Seaton Valley, Northumb.—Construction of streets and sewers for 172 houses at Murton Grange estate, Shiremoor, for U.D.C. Documents from the Surveyor, Council Offices, Seaton Delaval, Whitley Bay. Tenders by April 8.

Shipley, Yorks.—Construction of the following for U.D.C.: Back Maddocks Street (West), 53 lin. yd.; Maddocks Street, 140 lin. yd.; Back Street, between Maddocks Street and Rhodes Street, 136 lin. yd.; Rhodes Street, 112 lin. yd.; Back Street between Rhodes Street and Baker Street, 112 lin. yd.; Baker Street, 130 lin. yd.; Back Baker Street, 44 lin. yd.; Caroline Street, 220 lin. yd. Documents from the Surveyor, Town Hall, Shipley. Deposit £1 1s. Tenders by March 30.

Southampton.—Following contracts, which comprise making-up roads with tarmacadam carriageways and footways, concrete kerbs and channels, surface water drainage and incidental works for B.C.: (Contract PSW81) Comprising eight streets in Bassett district (approximate total length 2,332yd.); (PSW85) Douglas Crescent (approximate length 568yd.). Applications to the Borough Engineer and Surveyor, Civic Centre, Southampton, by March 30.

Staines, Middx.—Making-up of part of the street known as Leacroft Close for U.D.C. Following approximate quantities together with ancillary works: Excavate 100 cu. yd.; gravel asphalt carriageway with hardcore foundation, 270 sq. yd.; kerb and channel, 135 lin. yd.; artificial stone paving, 185 sq. yd.; grass verge, 200sq. yd.; two soakaways. Documents from the office of the Engineer and Surveyor, 240 London Road, Staines. Deposit £2 2s. Tenders by April 6.

Stirlingshire.—Falkirk-Bathgate road, earthworks, for C.C. Work includes 12,000 cu. yd. of excavation and 8,000 cu. yd. of imported material. Documents from County Road Surveyor, Causewayhead School, by Stirling.

Tenterden, Kent.—Construction of new access road and ancillary works to be carried out in the Glebe Fields for B.C. Documents from R. J. Nichols, borough surveyor, Town Hall, Tenterden. Deposit £2 2s. Tenders by March 30.

Thornton Cleveleys, Lancs.—Making-up of Meadows Avenue for U.D.C. Documents from J. E. Porter, engineer and surveyor, Council Offices, Thornton Cleveleys. Deposit £2 2s. Tenders by April 11.

Tonbridge, Kent.—Resurfacing of house paths at various housing estates for R.D.C., including total area approximately 3,600 sq. yd. Documents from the Engineer and Surveyor, 48 Pembury Road, Tonbridge. Tenders by April 12.

Tynemouth, Northumb.—Asphalt carpeting of carriageways for B.C. Tenders by April 4.

Wakefield, Yorks.—Making-up and paving of 155 lin. yd. of Woodland Drive and accommodation works for City Council. Documents from the City Engineer, Town Hall, Wakefield. Tenders by April 4.

Warwickshire.—Road embankment construction, trunk road A5, for C.C. Deposit £2 2s. Tenders by April 10.

Warwickshire.—Supplying and laying of plastic white lines on approximately 80 miles of road in various parts of the county during 1961-62, for C.C. Documents from the County Surveyor, Shire Hall, Warwick. Tenders by March 29.

Wigston, Leics.—Reconstruction of Kirkdale Road for U.D.C. Deposit £3 3s. Tenders by April 13.

Wiltshire.—Road improvement at Furze Hedge crossroads, junction of London-

Penzance trunk road A.303 with Warminster-Shafesbury road A.350 for C.C., comprising the excavation for, and construction of, new carriageway approximately 235 lin. yd., widening and realignment of existing carriage-ways approximately 600 lin. yd., together with surface water drainage, kerbing, fencing, etc. Documents from County Surveyor, County Hall, Trowbridge. Deposit £2. Tenders by April 4.

***Worcester.**—Site works at Warndon housing site, stage 2B, for City Council. Deposit £2 2s. Tenders by April 17.

SEWERAGE, SEWAGE AND REFUSE DISPOSAL

Abergavenny, Mon.—Llanvihangel Crucorney and Pandy sewerage and sewage disposal scheme (Contract 1) for R.D.C., comprising the laying of approximately 1,600 lin. yd. of 6in. diameter earthenware pipe sewers, together with manholes, pumping station, sewage treatment works and other appurtenant works. Documents from J. D. and D. M. Watson, consulting engineers, 67 Tufton Street, Westminster, S.W.1, on and after March 27. Deposit £10 10s., cheques payable to Council. Tenders by May 1.

Aldridge, Staffs.—Provision of concrete tubes, manholes and other ancillary works. Birmingham Road surface water sewer for U.D.C. Documents from the Engineer and Surveyor, The Poplars, 9 Leighwood Road, Aldridge. Deposit £2 2s. Tenders by April 5.

Alton, Hants.—Greatham drainage (Contract 7) for R.D.C., comprising the construction of: (a) Six inch diameter stoneware pipe sewers some 1,000 lin. yd. in length, together with manholes thereon; (b) ancillary works to the above. Documents from John Taylor and Sons, consulting engineers, Artillery House, Artillery Row, Westminster, S.W.1. Deposit £5 cheque only, payable to Council. Plans seen at the offices of the Council's Engineer and Surveyor, Barton End, Alton, Hampshire, or at the offices of the Consulting Engineer. Tenders by April 17.

Birmingham.—Supply to the Board's Minworth Works of approximately 275 tons of 27in. diameter spun-iron pipes and cast-iron pipe fittings for the Birmingham Tame and Rea District Drainage Board. Documents from the Engineer to the Board, Rookery Park, Erdington, Birmingham, 24. Tenders by April 10.

Brentwood, Essex.—Main drainage works at Herongate for U.D.C., comprising the laying of approximately 265 lin. yd. of 9in G.S.W. pipes, 537 lin. yd. of 6in. diameter G.S.W. pipes and the construction of 13 brick and concrete manholes. Documents from the Engineer and Surveyor, Council Offices, Brentwood. Deposit £1 1s. Tenders by March 30.

***Carmarthen.**—Works at Llanstephen and Laugharne for R.D.C. Deposit £2 2s. each. Tenders by April 12.

Chester.—Reconstruction of sewage disposal works (Contract 602) for City Council, comprising construction of water-retaining structures, including two primary digesters on piled foundations each of 100,000 cu. ft. gross capacity; four 6,000 cu. ft. consolidation tanks; one 6,000 cu. ft. gas holder foundation, together with an 80ft. x 40ft. brick control building on a reinforced concrete raft with a pump well and various ancillary works. It is anticipated that the contract documents will be ready in early May, 1961, to be returned by 12 noon June 9, 1961. It is hoped, subject to Ministry approval, to start work in September, 1961, with a contract period of 18 months. Firms should submit names and forward full details of the experiences on works of a similar nature to the City Engineer, 49 Northgate Street, Chester, by April 5.

Coulsdon and Purley, Surrey.—Surface water drainage, Woodcote Valley Road, Purley, for U.D.C., including construction of concrete soakaways and provision of new gulleys. Documents from the Council Offices, Purley. Deposit £3 3s. Tenders by April 4.

Dorchester.—Cerne Abbas sewerage and sewage disposal works as follows for R.D.C.: (a) provision and laying of approximately 2,300 lin. yd. of 6in. diameter sewers, together with all manholes and ancillary works; (b) construction of an ejector station and 1,000 lin. yd. of 5in. diameter rising main; (c) construction of sewage disposal works, comprising screening chambers, settlement tank, filter bed, humus tanks and sludge drying beds, complete with ancillary works, toolshed, access roads, etc.; (d) certain flood relief works into the River Cerne, embracing the dredging and widening of the river bed. Application for documents to W. Herbert Bateman and Partners, Chesterfield House, Bathaston, Bath, and the names and addresses of at least two engineers under whose direction similar works have been carried out by the applicant must also be submitted,

Deposit £5 5s., cheques payable to Council. Tenders by April 21.

Dungannon, Tyrone.—Construction of the Killeen sewerage scheme for R.D.C., comprising the laying of 1,529 lin. yd. 6in. diameter fire clay pipes, together with manholes and the construction of a sewage treatment works. Documents from the Rural District Council, Council Offices, Dungannon. Deposit £3 3s. An engineer will meet intending offerers at Killeen Cross Roads at 11 a.m. March 29 for the purpose of pointing out the site of the works. Tenders by April 10.

***Gosport, Hants.**—Piping of moat rear of baths for B.C. Deposit £1 1s. Tenders by April 12.

Hawarden, Flints.—Hope sewage disposal works extension for R.D.C., comprising the construction of a flow dividing chamber, a detritus and sedimentation tank, two humus tanks and two sludge drying beds, all in mass concrete; also two circular filter beds and various pipeworks on site. The works are situated near Caergwrle midway between Mold and Wrexham. Documents from Elliott and Brown, consulting engineers, Stanley House, Pelham Road, Nottingham. Deposit £5 5s., cheques payable to Council. Plans also seen at the Council Offices, Hawarden. Tenders by April 12.

Hinckley, Leics.—Laying of approximately 790 lin. yd. of 24in. and 18in. diameter concrete pipe foul sewer, together with brick manholes, reinforced concrete culvert, overflow chambers and ancillary works at Sketchley Hill estate for U.D.C. Documents from the Surveyor, Argent House, St. Mary's Road, Hinckley. Deposit £2. Tenders by April 13.

Langport, Som.—Reconstruction of the sewage disposal works at Kingsbury Episcopi, and a sewage pumping station at Stenbridge Ash for R.D.C. Applications including the names and addresses of three engineers under whose direction similar schemes have been carried out by the applicant to W. H. Bateman and Partners, consulting engineers, Chesterfield House, Bathaston, Bath. Deposit £3 3s. Plans seen by appointment, at the offices of the Council or the Bathaston office of the engineers during normal office hours, but technical questions will be dealt with only at the latter office. Tenders by April 17.

Leeds.—Following for City Council: (Contract 6761) Construction of new surface water sewers at Church Lane, Meanwood, Stainbeck Lane and Ring Road, West Park; (6762) filling of Meanwood goit, ancillary drainage, and the construction of Monkbridge overflow. Documents from Room 75, Civic Hall, Leeds. Deposit £3 3s. Tenders by April 14.

Longdendale, Ches.—Works of sewerage and sewage disposal in Longdendale, including provision for Manchester overspill development, comprising the following for U.D.C.: (1) Sewer construction, consisting of approximately six miles of 6in. to 36in. diameter concrete pipes, complete with precast concrete manholes and property connecting drains; (2) new disposal works, consisting of mechanical screen and grit channels, three 40ft. diameter sedimentation tanks with mechanical scrapers, three 96ft. diameter bacteria beds, two 40ft. diameter humus tanks with mechanical scrapers, sludge beds, sludge and liquor pumping station, roads and paths; (3) extensions to existing disposal works, consisting of detritus and sedimentation tanks, one 55ft. 6in. diameter bacteria bed, two vertical flow humus tanks, sludge beds, replacement pump, roads and paths. Applications, giving the names of three referees and brief particulars of similar contracts carried out recently to W. W. Sargent, clerk of the Council, Council Offices, Hollingworth, near Manchester, by first post, March 25.

***Lymm, Ches.**—Sewerage and sewage disposal for U.D.C. Deposit £5 5s. Tenders by May 16.

Manchester.—Supply and installation of approximately 600 lin. yd. of 415-volt, four-core, 0.3 sq. in. P.I.L.C.S.W.A. and S. cables at Davyhulme sewage works extensions, stage 1B, for City Council. Documents from the City Surveyor, Town Hall, Manchester, 2. Tenders by April 5.

North Down.—Construction of sewerage scheme at Ballybuttle and Ballyfrenis for R.D.C., comprising the providing and laying of approximately 920 lin. yd. of 6in. earthenware pipe, 2,400 lin. yd. of 9in. earthenware pipe and 190 lin. yd. of 9in. spun-iron pipe. Documents from Roe, Stevenson and Sons, quantity surveyors, 33 College Gardens, Belfast. Deposit £5 5s. Plans seen at the Council Offices, 2 Church Street, Newtownards. Tenders by April 18.

Pembroke.—Penally sewerage conversion scheme (Contract 1) involving work of connecting properties from the existing system of drainage into the new sewers already completed by the Council for R.D.C. The work will comprise excavating and refilling trenches

in roads, fields, lawns and gardens, supplying, laying and jointing 4in. and 6in. diameter salt glazed ware pipes, the construction of inspection chambers and other incidental works. Documents from the offices of J. A. Campodonic, clerk of the Council, Tudor House, Pembroke, or from J. Owen Parry and Lewis, consulting engineers, Arcade Chambers, Ammanford. Deposit £3 3s. Tenders by April 11.

Scunthorpe, Lincs.—Laying of approximately 2,470 lin. yd. of concrete pipe sewer of 9in. and 12in. diameter, together with manholes and ancillary works at Normanby Road, for B.C. Documents from F. J. Bowyer, borough surveyor, Laneham Street, Scunthorpe. Deposit £2 2s. Tenders by April 17.

***Southam, War.**—Ratley sewerage scheme for R.D.C. Deposit £5 5s. Tenders by April 10.

***Stokesley, Yorks.**—Yarm sewerage scheme for R.D.C. Deposit £5 5s. Tenders by April 12.

***Wayland, Norfolk.**—Extension of Exchange Street sewer, Attleborough (Contract 4) for R.D.C. Deposit £10 10s. Tenders by April 10.

***Whiston, Lancs.**—Sewerage and sewage disposal works at Halewood for R.D.C. Deposit £3 3s. Tenders by April 13.

STREET LIGHTING

Basildon, Essex.—Following for U.D.C.: (1) Supply and erection of 99 class B tungsten lamps on concrete columns; (2) supply of 225 pole bracket lamps. Documents from the Engineer and Surveyor, 88 Town Square, Basildon. Tenders by April 10.

***Bowden, Ches.**—Supply and erection of 105 group B concrete columns with post lanterns for U.D.C. Tenders by April 11.

Dunbartonshire.—Maintenance of street lighting within the above special district for the year May 16, 1961, to May 15, 1962, for C.C. This special district comprises the areas of Cardross, Craigendoran, Rhu, Garelochhead, Rosneath and Clynder, and tenders will be accepted for the whole or any part of the district. Documents from Neil Macdonald, county sanitary inspector, 124 Bridge Street, Alexandria, Tenders by April 11.

***Flintshire.**—Lighting of Penmynydd roundabout for C.C. Tenders by April 17.

AWARDS

BUILDING AND DECORATING (See also Housing Schemes)

Aston-on-Trent, Derbys.—Development at Aston Hall (contract 3): Two 40-bed blocks for children; two 30-bed blocks for disturbed patients; male and female patients' workshops for Sheffield Regional Hospital Board—W. J. Simms, Sons and Cooke, Ltd., Haydn Road, Sherwood, Nottingham, £200,417 (recommended).

Barnsley, Yorks.—Builders' work for ventilation of operating theatre at St. Helen Hospital for Sheffield Regional Hospital Board—Wm. Johnson, Ltd., Wombwell, £1,454 (recommended).

Barrow-in-Furness, Lancs.—Extensions and adaptations to Holker County Secondary School and the erection of a block of six garages at Carr Lane housing site for B.C.—Direct Labour, £64,954 and £1,183, respectively (recommended).

Beverley, Yorks.—Erection of 12 garages at Sample Avenue, Swinemoor housing estate, for B.C.—P. Jenkinson, 2 Ellerker Road, The Leases, Beverley, £1,560 (recommended in lieu of previous tender).

Birmingham.—Erection of a four-storey block of shops, showrooms and offices at New Street for Colonnade Developments, Ltd.—Tersons, Ltd., 4 Dollis Park, London, N.3, estimated cost £400,000. Cotton, Ballard and Blow, architects, Cavendish House, Waterloo Street, Birmingham, 2; and Oswald A. Wainwright and Partners, quantity surveyors, 5 Baker Street, London, W.1. Demolition of existing properties proceeding.

Bishop Auckland, Dur.—Erection of X-ray department at General Hospital for Newcastle Regional Hospital Board—Wright and Kellett, Ltd., Chester-le-Street, £41,437. P. H. Knighton, architect to the Board; and Thos. Barrett, Sons and Partners, quantity surveyors, 84 Grange Road, Middlesbrough.

Bristol.—Erection of new headquarters at Clifton for the University of Bristol Students' Union—Wm. Cowlin and Sons, Ltd., Stratton Street, Bristol, 2. Alec French and Partners, architects, Pearl Assurance House, Prince Street, Bristol, 1; and Messrs. Gleds, quantity surveyors, 2 Park Street, Bristol, 1. Scheme still in design stage.

Bristol.—Following for City Council: Conversions, improvements and repairs to 15 Egerton Road, Bishopston, and 9 Snowdon

Road, Fishponds—W. J. J. Lee, Bristol, £1,055, and W. J. Kew (Contractors), Ltd., Bedminster Down Road, Bristol, 3, £1,053, respectively (recommended).

Conversion of Kingsweston Stables into a sub-divisional police station—F. Tappenden and Son, Ltd., Bristol, £56,792 (recommended, subject to Ministry approval).

Buckfastleigh, Devon.—Additions to changing accommodation and improvements at the swimming baths for U.D.C.—Blight and Scoble, Ltd., 24 Chapel Street, Buckfastleigh, £1,848.

Cardiff.—Preliminary contract for the erection of new headquarters at Bute Terrace for the Wales Gas Board—Hinkins and Frewin, High Cross Farm, Rogerstone, near Newport, Mon.

Carlisle, Cumb.—Erection of factory at Dalston (about four miles from Carlisle) for Nestle, Ltd., St. George's House, Wood Street, London, E.C.2. J. Hammond Harvey, architect, 8 Kings Road, London, W.6—John Twinn, Ltd., Brigham, Cockermouth, Cumberland, £250,000.

Cookstown, Tyrone.—Construction of concrete bases for poultry houses, paved areas, etc., Loughry Agricultural College for Ministry of Finance—Benson Bros. (Cookstown), Ltd., Killymoon, Cookstown.

Cumberland.—Main block of the new hospital at Hensingham, near Whitehaven, for the Newcastle Regional Hospital Board—John Laing and Co., Dalston Road, Carlisle, £1,955,131. Work to commence April 10.

Derby.—Builder's work for improvements to heating system in nurses' home at Kingsway Hospital for Sheffield Regional Hospital Board—J. H. Fryer, Ltd., Great Northern Road, Derby, £906 (recommended).

Dublin, Eire.—Erection of factory at Dundrum for Pye (Ireland), Ltd.—J. and D. McIlvenna, Ltd., Tolka Bridge, Dublin, estimated cost £140,000. Robinson Keefe and Devane, architects, 22 Lower Baggot Street, Dublin; and Henry D. W. Boyd and Co., quantity surveyors, 28-30 Upper Baggot Street, Dublin. Site excavations completed.

Durham.—Following for C.C.: Alterations and additions to Frosterley South County School—George Stephenson (Builders and Contractors), Ltd., Chester Street, Bishop Auckland, £31,141.

Erection of day school at Hare Law—Middleton and Co., Ltd., Queen Alexandra Bridge Approach, Sunderland, £57,603.

Alterations to Rookhope Junior and Infant School—R. W. Metcalfe, Wolsingham, Co. Durham, £15,000.

Erection of modern school at Wingate—H. Hewitt and Son, Ltd., Station Works, Haswell, Co. Durham, £100,000.

Edmonton, Middx.—Redecoration at Brettenham Primary, Eldon Primary, Galliard Primary, Raglan Primary, Wilbury Way Primary and Eldon Secondary Schools for Co. E.C.—Direct Labour (recommended). Estimated cost £6,800, £7,225, £3,000, £10,370, £4,500 and £5,725, respectively.

Felling, Dur.—Erection of community and youth centre at Leam Lane for Co. E.C. Tarren and Callar, architects, 26 Front Street, Sedgefield—Robson Bros. (Contractors), Ltd., 6 Chichester Road, South Shields, £20,730.

Glasgow.—Extensions to Royal College of Science and Technology at 204 George Street—several works, phases I and II—Thaw and Campbell, Ltd., 136 Paton Street, Glasgow, E.1: electrical installation, phases I and II—A. Robertson and Co., 28 Sandyford Place, Glasgow, C.3; heating and ventilation installations, phase I (chemical technology block)—Wm. Pyle and Co., 12 South Scott Street, Baillieston, near Glasgow; ventilation installation, phase II (engineering extension II)—Wm. Pyle and Co., 12 South Scott Street, Baillieston, near Glasgow; heating installation, phase II (engineering extension II)—James Boyd and Sons, Ltd., McDowall Street, Paisley, Walter Underwood and Partners, architects, 2 La Belle Place, Glasgow, C.3; and Muirhead, Muir and Webster, 154 West George Street, Glasgow, quantity surveyors.

Harrogate, Yorks.—Following for B.C.: Painting of (a) 128 houses at Devonshire Place and 128 houses at Ripon Road; and (b) 282 houses at Grove House estate—(a) United Painters and Decorators, 73 Bradford Road, Shipley, £3,090; and (b) Frank Wood (Decorations), Ltd., Decor House, Greenhead Road, Huddersfield, £3,050; erection of public conveniences and changing rooms at Oatlands Park—J. Waddington (Builders), Ltd., Kirby Hill, Boroughbridge, £1,933 and £1,125, respectively (recommended).

Hastings, Sussex.—External painting of houses at Rock Lane estate during the current

financial year for B.C.: One hundred and four houses—R. T. Griffiths, 12 Strood Road, St. Leonards-on-Sea, £1,473; 96 houses—Sussex Decorators, Hughenden Road, Hastings, £1,558 (recommended).

Hayes and Harlington, Middx.—Internal and external redecoration at Townfield Secondary Boys' and Girls' Schools for Co. E.C.—Direct Labour (recommended). Estimated cost £8,400.

Hendon, Middx.—Following for B.C.: External redecoration to housing properties during 1961-62, section I—William Moss and Son, Ltd., North Circular Road, London, N.W.2, £3,756; and sections 3, 4 and 6—P. J. Hartel (London), Ltd., 1 Montague Street, London, W.C.1, £4,270, £2,728 and £952, respectively; alterations to existing dust trap of No. 1 plant at the Refuse Disposal Works—Heenan and Froude, Ltd., 30 St. James' Square, London, S.W.1, £3,898 (recommended).

Provision of kitchens at Colindale, The Hyde, Childs Hill, and Edgware Junior and Infants' Schools—Bird and Cargill, Ltd., Bellrock Works, Gloucester Road, London, W.5, £21,039 (recommended, subject to approval).

Hereford.—Demolition of the existing buildings in Broad Street and the erection of a reinforced concrete building extending from Broad Street to Aubrey Street at the rear for Ministry of Works—Wilson Lovatt and Sons, Ltd., Clarence Street, Wolverhampton, £124,000.

Herefordshire.—Erection of the first instalment of a new school at Garway for C.C., comprising kitchen, dining-assembly hall, two classrooms, cloak and lavatory accommodation, etc., in single-storey construction. W. Usher, county architect—Wm. Powell and Sons (Builders), Ltd., Whitehorse Street, Hereford. Work just commenced.

Jarrow, Dur.—Erection of new Dunn Street Junior and Infant School for C.C. G. W. Gelson, county architect—Wigham and Son, Shepherd Terrace, Hylton, Sunderland, £59,614.

Leicester.—Builder's work for engineering services at Royal Infirmary for Sheffield Regional Hospital Board—Henry Herbert and Sons, 33 Millstone Lane, Leicester, £3,098 (recommended).

Limerick, Eire.—Rebuilding of a departmental store in O'Connell Street for Messrs. Cannocks—P. Cullen, 18 Rhebog Avenue, Corbally, Limerick, £45,000. John C. Thompson, architect, 4 Cul-Nagrine, Clancy Strand, Limerick; Cuddy and Walker, quantity surveyors, 64 O'Connell Street, Limerick; and Stanislaus Kenny, consulting engineers, 35 St. Stephen's Green, Dublin. Work commencing.

Luton, Beds.—Provision of new lavatory accommodation at Norton Road School for B.C.—Connolly Bros., 11 Ashburnham Road, Luton, £5,053 (recommended).

Maidenhead, Berks.—Erection of garages at Larchfield estate and Spencers estate for B.C.—Knibbs and Layton, High Wycombe, Bucks., £3,930 (recommended, subject to Ministry approval).

Mickleover, Derbys.—Enlargement of kitchen at admission hospital, The Pastures, for Sheffield Regional Hospital Board—J. H. Fryer, Ltd., Great Northern Road, Derby £19,660 (recommended).

Middlesbrough, Yorks.—Alterations and additions to ambulance station, Ayresome Green Lane for B.C.—J. Watson, Ltd., Hill House, Salisbury Terrace, Norton, Stockton-on-Tees, £3,808 (recommended).

Morpeth, Northumb.—Alterations and extensions to the administration building at Northgate and District Hospital for Newcastle Regional Hospital Board—R. Hush and Co., Ltd., Blyth, £10,285. P. H. Knighton, architect to the Board; and Vail and Macara, Grainger Chambers, Hood Street, Newcastle upon Tyne, 1, quantity surveyors.

Newark, Notts.—Builder's work for centralisation of boiler plant at Newark Hospital for Sheffield Regional Hospital Board—Ernest Coleman, Ltd., 20 Diamond Avenue, Kirby-in-Ashfield, £4,310 (recommended).

Newcastle upon Tyne.—Following for City Council: Conversion of Chillingham Road Secondary Modern School—J. Sutton and Son (Contractors), Ltd., Tinn Street, Gateshead, 8, £4,307; interior painting of workshops at Byker Depot—Good Bros., 2 Benton Terrace, Newcastle upon Tyne, 2, £1,444; replacement of greenhouse superstructure, Elswick Cemetery—R. Halliday and Co., Ltd., Market Place, Middleton, £1,259; slating and tiling repairs to houses on Corporation housing estates for 12 months from April 1, 1961—J. Hewitson, Ltd., Leazes Park Road, Newcastle, 1, £7,135.

Erection of a welfare centre and clinic with two flats at Strathearn Way, Fawdon—H. R. Atkinson and Co., Ltd., Belle Village, Ponteland, £14,206 (recommended).

Newport, Mon.—Prestcore bored pile foundations for new 500-ton bunker for British Aluminium Co., Ltd.—Davies, Middleton and Davies, Ltd., Phoenix Works, Caerphilly Road, Cardiff. Work has commenced.

Oldham, Lancs.—Erection of post office radio station at Windy Hill, Halifax Road, near Oldham, for Ministry of Works—J. Gerrard and Sons, Ltd., Swinton, Lancs., £22,440. Buildings have been designed in the Chief Architect's Division, Ministry of Works. M. H. Bristow, senior architect; Tucker and Huntley, 110 Old Brompton Road, London, S.W.7, quantity surveyors.

Portishead, Som.—Prestcore bored pile foundations for new gas flare and burner for Albright and Wilson, Ltd.—Davies, Middleton and Davies, Ltd., Phoenix Works, Caerphilly Road, Cardiff. Work has commenced.

Portsmouth.—Erection of new shop premises with living accommodation above at Sultan Road/Malins Road junction, Landport, for Portsea Island Mutual Co-operative Society, Ltd. Plans by company architects' department—Direct Labour, estimated cost £15,000. Work has commenced.

Complete rebuilding of original factory recently destroyed by fire at Regent Street, Landport, for William Fletcher, Jr., Ltd. C. A. Jolliffe and Partners, architects, 35 Kingston Crescent, North End, Portsmouth—F. J. Privett, Ltd., Privett House, Copnor Road, Portsmouth, estimated cost £100,000. Work to commence in approximately three months.

Portsmouth.—Following for City Council: Erection of two science laboratories and remodelling of three existing rooms at Portsmouth Modern School for Boys—Jno. Croad, Ltd., Portland Street, Portsmouth, £16,525 (recommended); Hassocks Properties Development Co., Ltd., £17,105; Payne Bros. (Portsmouth), Ltd., £17,969; John C. Nicholls, Ltd., £19,955.

Alterations and extensions to the chemistry and physics laboratory at the Northern Grammar School for Boys—Direct Labour, £11,974 (recommended); Jno. Croad, Ltd., £13,100; Henry Jones and Son (Portsmouth), Ltd., £13,273; Payne Bros. (Portsmouth), Ltd., £13,960.

Alterations and additions at Garrison Junior Mixed and Infants' School—Payne Bros. (Portsmouth), Ltd., Fitzherbert Road, Farlington, Portsmouth, £3,497 (recommended); W. J. Waldron, £3,645; Jno. Croad, Ltd., £3,885.

Reconstruction of war damage at Drayton Road Infants' School—Payne Bros. (Portsmouth), Ltd., £18,742 (recommended); Henry Jones and Son, (Portsmouth), Ltd., £23,631; Jno. Croad, Ltd., £24,789.

Portsmouth Technical High School, phase IV—Payne Bros. (Portsmouth), Ltd., £6,241 (recommended); Jno. Croad, Ltd., £7,016; John Hunt, Ltd., £7,262; Henry Jones and Son (Portsmouth), Ltd., £7,495; John Lay and Co. (Portsmouth), Ltd., £7,543.

Improvements to sixth form accommodation at Southern Grammar School for Girls—Payne Bros. (Portsmouth), Ltd., £1,435 (recommended); Direct Labour, £1,499; Jno. Croad, Ltd., £1,672; Geo. Riches, Ltd., £1,766.

Extensions and alterations to the pharmacy and physiology department at the College of Technology—Jno. Croad, Ltd., £29,422 (recommended); Payne Bros. (Portsmouth), Ltd., £30,960; Enfin, Ltd., £31,399; Henry Jones and Son (Portsmouth), Ltd., £31,659.

External re-painting of South Parade Pier—Barnes and Elliott, Ltd., 15a Castle Road, Southsea, £3,176 (recommended); T. P. Hartell (Southern), Ltd., £2,945; T. Stride and Son, £3,285; Direct Labour, £3,914.

Three shops and maisonnettes and three garages at Prospect Farm—J. C. Nicholls, Ltd., Fitzherbert Road, Farlington, Portsmouth, £19,850 (recommended); Jno. Croad, Ltd., £19,976.

Plumbing and glazing work at various educational establishments during year ending March 31, 1962—E. J. Brockway, Ltd., 91 Kingston Road, Portsmouth, and Mark Cook and Sons, Ltd., 25 Greatham Street, Portsmouth, respectively (recommended).

Salford, Lancs.—Extensions and rebuilding of premises for Cussons, Sons and Co., Ltd.—J. Gerrard and Sons, Ltd., Swinton, Lancs. Estimated cost £69,000. Mather and Nutter, architects, 3 Chepstow Street, Manchester, 1; Whealing, Horton and Toms, 103 Portland Street, Manchester, 1, quantity surveyors.

Scunthorpe, Lincs.—Erection of 24 garages at Laburnum Grove and Lincoln Gardens for B.C.—H. N. Slingsby, 81 Priory Lane, Scunthorpe, £3,580 (recommended).

Sheffield.—Builder's work for coal-handling plant at Lodge Moor Hospital for Sheffield Regional Hospital Board—W. Marlow and Sons, Ltd., Holme Lane, Sheffield, 6, £1,675 (recommended).

Somerset.—Erection of a church at R.A.F. Station, Locking—Sir Lindsay Parkinson and Co., Ltd., 6 Lambeth Road, London, S.E.1. Estimated cost £13,500.

Sunderland, Dur.—Erection of first stage of comprehensive school at Hylton Red House estate for B.C.—Direct Labour, £406,326.

Sunderland, Dur.—Erection of community centre at Hylton Road House estate for B.C.—Thomas Stewart, The Oval, Southwick, Sunderland, £16,950 (accepted); R. J. Edwards and Co., £17,748; Mark Forster, £17,806; Joseph Huntley and Son, Ltd., £17,911; Arthur R. Cowell, £17,995; George Henderson, £18,330; Public Works Department, £18,499; T.G. Construction Co., Ltd., £18,540; T. D. Gibbons and Son, Ltd., £18,723; Quayle and Pye, £19,006; Ralph Bowey and Son, Ltd., £19,780; John Laing, Ltd., £20,330; John Twinn, Ltd., £23,000. Work commencing March 31.

Sunderland, Dur.—Extensions at High Street West for British Home Stores, Ltd., London, N.W.1—H. Fairweather and Co., Hyde Works, St. James's Lane, London, N.10.

Sunderland, Dur.—Following for E.C.: Erection of Town End Junior and Infant School—Tate and Holmes, Benwell, Newcastle upon Tyne, £118,470; erection of temporary workshops at South Johnson Street for the College of Further Education—Walter Horn and Sons, Liverpool, £20,456.

Surbiton, Surrey.—Construction of a prefabricated pavilion at King George's Field, Tolworth, for B.C.—Reema Construction, Ltd., Salisbury, £24,122 (recommended).

Swansea.—Erection of the Swansea Training College assembly hall, dining room and common room block for B.C.—Rees and Kirby, Ltd., Foundry Street, Morriston, Swansea, £106,000 (recommended).

Taunton, Som.—Extensions to 40 North Street for British Home Stores, Ltd.—H. Fairweather and Co., Ltd., London, N.10.

Wallasey, Ches.—Ten brick garages on three sites in the Cook Road/Raleigh Road area of Leasowe for B.C.—T. W. Glover and Son, Ltd., 2 Croxteth Avenue, Wallasey. Work commenced.

Walton-on-Thames, Surrey.—Erection of a chlorination house and laboratories, road and ancillary works at Walton South reser-

voir for M.W.B.—W. H. Gaze, and Sons, Ltd., 19 High Street, Kingston-on-Thames, £29,877.

Wandsworth.—Following for L.C.C.: Erection of new buildings at Mount Clare and Downshire House for the use of the Garnett College, Southwark—Rush and Tompkins, Ltd., Sidcup, Kent, £421,688 (accepted); Wilson Lovatt and Sons, Ltd., £431,668; A. T. Rowley (London), Ltd., £433,198; Leslie and Co., Ltd., £434,065; W. J. Simms, Sons and Cooke, Ltd., £435,623; The Demolition and Construction Co., Ltd., £435,627; Kirk and Kirk, Ltd., £436,183; M. J. Gleeson (Contractors), Ltd., £438,274; Rowley Bros., Ltd., £439,828; J. Gerrard and Sons, Ltd., £448,355.

Restoration and adaptation work at Mount Clare and Downshire House—W. J. Marston and Son, Ltd., 1 Stephendale Road, London, S.W.6, £56,843 (accepted); Holland & Hannen and Cubitts (Great Britain), Ltd., £57,586; Marshall Andrew and Co., Ltd., £59,784; W. H. Gaze and Sons, Ltd., £60,582.

Wandsworth.—Construction of an area office, works depot, 17 garages and two motorcycle stores at Ashburton estate for L.C.C.—G. Ward (Ealing), Ltd., Ealing, Middx., £28,935 (accepted); H. T. Oliver and Sons, Ltd., £30,057; Poolman (Builders), Ltd., £31,116; M. Howard (Mitcham), Ltd., £31,256; Wm. J. Jerram, Ltd., £31,512; E. J. Lacy and Co., Ltd., £31,904; Sims and Russell, Ltd., £32,886; T. R. Roberts (Builders), Ltd., £35,483.

Washington, Dur.—Erection of Civil Defence training and recreation centre at Blue House Lane for the U.D.C.—E. R. Willey and Son, Victoria Road, Washington, £5,825.

Wigan, Lancs.—Erection of new depot off Miles Lane, Shevington, for R.D.C.—J. W. Liptrot, Ltd., Brook Lane, Pemberton, £4,800.

Worcester.—Alterations to 116 and 157 Rose Avenue, Tolladine estate for City Council—W. Hundley, Worcester, £860 (recommended).

York.—Following for City Council, E. Firth, city architect, 8 St. Leonard's Place, York: Partial demolition and reconstruction of old warehouse building into shop, with offices over, at Patrick Pool/Newgate—W. Birch and Sons, Ltd., Spenlane, York, £8,791; erection of bicycle accommodation at three schools—New Wortley Crane and Hoist Co., Wortley Lane, Leeds, 11, £4,251; extension to existing classroom at Ashbank Remand Home, Clifton, York—T. Valey and Son, St. Maurice's Road, York, £1,078.

CLOTHING AND TEXTILES

Barrow-in-Furness, Lancs.—Supply of following for B.C.: 30 donkey jackets—S. Miller (Manchester), Ltd., 47 Chorlton Street, Manchester, 1, £1 12s. 8d. each; 45 duffle coats—The Reggan Clothing Manufacturers, Ltd., 62 Carstairs Street, Glasgow, S.E., £2 0s. 6d. each; men's Paramatta mackintoshes, (a) 23 without belts and (b) 37 with belts—Greengate and Irwell Rubber Co., Ltd., Greengate, Salford, Manchester, 3, (a) £3 11s. 7d. each, and (b) £3 16s. 11d. each; (c) 130 P.V.C. leggings and (d) 39 P.V.C. mackintoshes—Timeg, Ltd., 102 Wardour Street, London, W.1, (c) 9s. 6d. per pair and (d) £1 12s. 6d. each; (e) 100 painters' white bib and brace and (f) 100 painters' white jackets—James Varley and Co., Ltd., Blackburn, (e) 17s. 3d. each and (f) 17s. 9d. each; (g) 38 plasterers' white bib and brace, (h) 38 plasterers' white jackets and (i) 127 navy R.A.F. boiler suits—Supercraft (Garments), Ltd., Oldham, (g) 17s. 1d. each, (h) 17s. 1d. each and (i) £1 8s. 2d. each (recommended).

DEMOLITION

Ashton-under-Lyne, Lancs.—Demolition of 73-83 Warrington Street for B.C.—K. Shepley, 73 Boodle Street, Ashton-under-Lyne, £90.

Beverley, Yorks.—Demolition of school at junction of St. Nicholas Road and Holme Church Lane, for B.C.—J. Thompson and Son, Ltd., Beverley, to pay Council £15 (recommended).

Dewsbury, Yorks.—Demolition of 30 houses for the slum clearance programme, contract 53, for B.C.—B. Gill, Bradford, £335 (recommended).

Northumberland.—Dismantling and transfer of buildings and equipment from the Civil Defence Training Centre at Darras Hall, Ponteland, to Civil Defence Headquarters at Southgate, Morpeth, for C.C.—H. R. Atkinson and Co., Ltd., Contract House, Ponteland, near Newcastle upon Tyne.

Reading, Berks.—Demolition of following for B.C.: 5 and 7 Peppard Road—Direct Labour; 6 and 8 Southampton Street—Page (Demolition Contractors), Nine Mile Ride, Wokingham, to pay Corporation £16 10s. (recommended).

Scunthorpe, Lincs.—Demolition of 71-83 Dunstall Street for B.C.—M. Leyden, Brigg Road, Scunthorpe, £174 (recommended).

Stretford, Lancs.—Demolition of 42 Northumberland Road and 1 and 2 Canute Cottages for B.C.—M. J. Duffy, Ltd., 49 Moss Lane West, Manchester, 5, £45, and J. Watkinson, Gates Farm, Sandy Lane, Stretford, £90, respectively (recommended).

ELECTRICAL

Blackburn, Lancs.—Re-siting and modernisation of the traffic signals at the junction of Accrington Road and Burnley Road for B.C.—Automatic Telephone and Electric Co., Ltd., Strowger House, 8 Arundel Street, London, W.C.2, £1,105 (recommended, subject to M.T. approval).

Durham.—Re-wiring of Bowes Museum, Barnard Castle, for Co. E.C.—Cox-Walkers, Ltd., Darlington, £1,437.

Eccles, Lancs.—Electrical installations at Peel Green branch library for B.C.—R. J. Bull, Clifton, £1,760 (recommended, in lieu of previous tender).

Lincoln.—Staff location system at County Hospital and St. George's and City Hospital for Sheffield Regional Hospital Board—Multitone Electrics Co., Ltd., 25 Dover Street, London, W.1 £1,270 and £2,210, respectively (recommended).

Gateshead, Dur.—Electrical installation at the new Greenwell Secondary Modern Girls' School for B.C.—Cook and Dawson, South Shields, £6,700.

Hastings, Sussex.—Supply of lighting fittings and lamps at the College of Further Education for B.C.—A.E.I. Lamp and Lighting Co., Ltd., 132 Long Acre, London, W.C.2, £2,570 (recommended).

Luton, Beds.—Electrical installation at (a) the Central Depot, (b) for 18 flats at Lensey estate, and (c) Mead's Infants' School for B.C.—J. and J. Burtenshaw (Partners), Ltd., Luton, (a) £7,391, (b) £1,196, and (c) £2,650 (recommended).

Newcastle upon Tyne.—Electrical repairs to houses on Corporation housing estates for 12 months from April 1, 1961, for City Council—Gray Bros., Ltd., 149 Pilgrim Street, Newcastle upon Tyne, £6,149.

Newcastle upon Tyne.—Following for Regional Hospital Board: Installation of P.A.B.X. telephone system at Preston Hospital, North Shields, and Dryburn Hospital, Durham—Reliance Telephone Co., Ltd., The Magnet House, Gallowgate, Newcastle, 2, £9,329 and £7,521, respectively.

Northallerton, Yorks.—Electrical work for additions to Friarage Hospital for Newcastle Regional Hospital Board—Heslop and Hall, West Hartlepool, £2,336.

Scunthorpe, Lincs.—Electrical installations in grouped dwellings at Riddings estate for B.C.—Hobson and Scott, Ltd., 221 Chip-pinghouse Road, Sheffield, £874 (recommended).

Sheffield.—Supply of lift at Fir Vale Infirmary and lift in Cliff Ward at Nether Edge Hospital for Regional Hospital Board—Etchells Congdon and Muir, Ltd., Manchester, £4,094 and £3,781, respectively (recommended).

Sutton and Cheam, Surrey.—Improvements to the traffic signal installations at Cheam Village, including the installation of pedestrian push-button controls, and at the Queen Victoria junction incorporating sequent amber for B.C.—Automatic Telephone and Electric Co., Ltd., Strowger House, 8 Arundel Street, London, W.C.2, £1,167 and £884, respectively (recommended).

Walton-on-Thames, Surrey.—Supply, installation and connection of power, control, instrumentation and telephone cables, lighting and telephones, etc., at Walton pumping station for M.W.B.—Electrical Installations, Ltd., 65 Vincent Square, London, S.W.1, £81,432.

FENCING

Croydon, Surrey.—Erection of plastic-covered chain-link fencing on the boundary of the Therapia Lane highways tip for B.C.—Boulton and Paul, Ltd., Riverside Works, Norwich, £447.

Newcastle upon Tyne.—Erection of iron fencing at Edgefield Primary School for City Council—J. R. Thompson, North Hill, Dinnington Village, Ponteland, £1,193.

GAS AND WATER SUPPLY

Ballycastle, Antrim.—Water scheme at Cushendall/Cushendun for R.D.C., including the provision and laying of approximately 6½ miles of 5in. diameter, 4in. diameter and 3in. diameter water mains in asbestos, cast-iron and rigid P.V.C., and the construction of two 40,000-gallon concrete service reservoirs, complete with intake works, chlorinator and meter houses, and other ancillary works. O. N. Wheeler, architect, 9 Donegal Square South, Belfast—Murray and Partners, Glenariffe, Co. Antrim, £32,740 (accepted); A. Cusick, £35,259; Mullan Bros., £36,401; J. Wallace and Sons, £37,565; O'Neill Bros., £37,995; P. McCollam, £38,471; Tracey Bros., £40,912; McLaughlin Bros., £41,607; David Patton and Sons, £42,581. Work commencing April 1.

Hastings, Sussex.—Supply of filtration equipment for the completion of filters and sedimentation tank at Brede Valley Pumping

Station for B.C.—Paterson Engineering Co., Ltd., 129 Kingsway, London, W.C.2, £9,021 (recommended extension of contract).

Leicester.—Cold water services to pathology laboratory at Royal Infirmary for Sheffield Regional Hospital Board—William Freer, Ltd., Leicester, £720 (recommended).

Ludlow, Salop.—Laying of water mains for the construction of approximately 440yd. of 3in. diameter asbestos-cement mains at Pinkham and Catherton Road, Cleobury Mortimer, for R.D.C.—Edward Thompson, Ltd., Grange Street, Derby, £927 (accepted); Robert Powdrill, Ltd., £1,037.

Lurgan, Armagh.—Supplying and laying of approximately 330 lin. yd. of 12in. diameter and 470 lin. yd. of 9in. diameter fireclay pipes, together with other ancillary works for B.C. W. D. R. and R. T. Taggart, consulting engineers, 13 College Gardens, Belfast, 9—T. G. Gilmore, Toberhewney Lane, Lurgan, £3,634. Work commenced.

Middlesbrough, Yorks.—Supply of steel pipes to be laid between Sadberge reservoir and Long Newton for the Tees Valley and Cleveland Water Board—South Durham Steel and Iron Co., Ltd., Middlesbrough, £67,815.

Motherwell and Wishaw, Lanarks.—Construction of a 2,500,000-gallon reinforced concrete-covered, clear-water reservoir at Legbrannock, near Newarthill, for B.C. F. A. Macdonald and Partners, consulting engineers, 11 Woodside Terrace, Glasgow, C.3—James Turner and Co., Ltd., Westfield Street, Edinburgh, £55,731 (accepted); Broadside Construction Co., Ltd., £56,444; W. and J. R. Watson, Ltd., £59,194; Fram Reinforced Concrete Co. (Scotland), Ltd., £59,547; Hugh Leggat, Ltd., £60,900; McLean and Co., £61,144; Strathclyde Structures, Ltd., £63,949; Crowley Russell and Co., Ltd., £68,906; Farrans, Ltd., £69,960; Tileman and Co., Ltd., £76,309; James Young (Contractors), Ltd., £96,907. Work commenced soon.

HARBOURS, PIERS AND SEA DEFENCE WORKS

Cardiff.—Construction of accumulator foundation at No. 1 pumping station, Cardiff Docks, for British Transport Commission—Davies, Middleton and Davies, Ltd., Phoenix Works, Caerphilly Road, Cardiff. Work has commenced.

Coleraine, Derry.—Reconstruction of reinforced concrete wharf for Harbour Commissioners.



REPRESENTATIVE FOR EUROPE

J. G. Bamford (Excavators) Limited, Europe's largest manufacturer of hydraulic excavators, requires a representative speaking fluent French and German to make regular sales visits to the Continent. The appointment is based on Uttoxeter and calls for a man of forceful personality, preferably with experience of earthmoving equipment, and within the age bracket 27 - 35 years. The position carries a high level of responsibility and is of the greatest importance to the Company, which exports some 40% of its output. Only representatives of the highest calibre wishing to make a career for themselves in this rapidly expanding industry will be considered.

Salary by arrangement, dependent on experience and qualifications. The post is superannuated.

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A. F. Chapman, consulting engineer, The Quay, Poole, Dorset—John Rainey (Construction), Ltd., Portrush, £45,843 (accepted); Concrete Piling, Ltd., £53,355; Farrans, Ltd., £64,191; Cementation Co., Ltd., £60,374; F. B. McKee and Co., Ltd., £58,816; R. J. Campbell (Belfast), Ltd., £70,000; Norden, Ltd., £62,862. Work commencing April.

HEATING AND VENTILATING

Barnsley, Yorks.—Installation of calorifiers for new boiler plant and mechanical services for ventilation of operating theatre at St. Helen Hospital for Sheffield Regional Hospital Board—H. Hilton (Nottingham), Ltd., 64 Arkwright Street, Nottingham, £1,957, and W. A. Church and Sons, 17 Southgate, Wakefield, £33,570, respectively (recommended).

Derby.—Improvements to heating in nurses' home at Kingsway Hospital for Sheffield Regional Hospital Board—R. Longdon and Co., Derwent Works, Plumpton, Avenue, Derby, £3,937 (recommended).

Eccles, Lancs.—Installation of night storage block heaters and necessary lighting points at the offices of the Rates and Housing Departments for B.C.—North-Western Electricity Board, £1,350 (recommended).

Grimsby, Lincs.—Replacement of boilers at Louth and District Hospital for Sheffield Regional Hospital Board—A. K. Singer, Ltd., 48 High Street, Skegness, £6,365 (recommended).

Larne, Antrim.—Heating installation at Municipal Offices, Victoria Road, for B.C. Abbott and Partners, consulting engineers, 16 Bedford Street, Belfast—Fuel Efficiency Products (N.I.), Ltd., Larne, £3,837 (accepted); Ashwell and Nesbitt, Ltd., £4,189; Shillington (Heating and Plumbing), Ltd., £4,225; J. W. Thomson (Plumbing and Heating), Ltd., £4,370; Lawther's, Ltd., £4,400. Work commencing soon.

Luton, Beds.—Following for B.C.: Installation of ventilating system at the new Central Library—William Freer, Ltd., 49 Red Lion Street, London, W.C.1, £11,995; heating, hot and cold water services at the Mead's Infants' School—Weldability Engineering Co., 28 Bradford Road, Dunstable, £6,100; heating for the new Central Depot—S. Smart and Co., The Hyde, near Luton, £14,805 (recommended).

Nottingham.—Mechanical services for installation of boiler controls at City Hospital for Sheffield Regional Hospital Board—

—H. Hilton (Nottingham), Ltd., 64 Arkwright Street, Nottingham, £2,830 (recommended).

South Cambridgeshire.—Installation of hot and cold water services, provision of bathrooms, including w.c. suites and drainage work, to 28 houses, Stocks Lane and Cinques Road, Gamlingay, for R.D.C. W. R. Hazelwood, architect—Heath Bros., 129 Sun Street, Biggleswade, £14,213. Work commencing May 1.

HOUSING SCHEMES

Aveley, Essex.—Eight terrace houses at Broxburn Drive site, and four terrace houses and eight garages at Shannon Way site for L.C.C.—Gray, Conoley and Co., Ltd., 29 Stephenson Street, London, E.16, £25,950 (accepted); Douglas Grant and Partners, Ltd., £27,243; A. E. Symes, Ltd., £28,383; F. R. Hipperson and Son, Ltd., £28,873; R. J. Truscott, Ltd., £29,140.

Barrow-in-Furness, Lancs.—Thirty-two flats at Carr Lane housing site for B.C.—Direct Labour, £49,735 (recommended).

Bridge-Blean, Kent.—Twenty-four houses at Sturry for R.D.C.—S. R. Howell and Son, Ltd., 21 Minster Drive, Herne Bay, Kent, £36,492.

Bridgwater, Som.—Four houses for R.D.C.—Hodge Bros., Orchard Lea, Huntworth, Bridgwater, £6,448.

Chancetonbury, Sussex.—Improvements to 16 pre-war houses at Warren Hamlet, Sullington, for R.D.C.—H. Cotton, Ltd., Storrington, £5,987.

Colchester, Essex.—Eighty houses and 67 garages at Greenstead estate, and 35 garages at Harwich Road estate for B.C.—Direct Labour. Estimated cost £140,000.

Halesworth, Suffolk.—Five bungalows on a slum clearance site in Chediston Street, and the demolition of the existing properties on the site known as 7 to 14 Chediston Street (inclusive) for U.D.C. R. Woodhouse Beales, architect, 3 Neale Street, Ipswich—Blackburns (Harleston), Ltd., The Thorofare, Harleston, £7,820.

Hartlepool, Dur.—Eighty-five houses for the North-Eastern Housing Association, Windsor Terrace, Newcastle upon Tyne. P. L. Browne, Son and Harding, architects, Pearl Buildings, Northumberland Street, Newcastle upon Tyne—G. M. Pearson and Son, Front Street, Hetton, Co. Durham; Work to start in April.

Herne Bay, Kent.—Following for U.D.C. J. C. Clague, architect, Lloyds Bank

Chambers—Twelve one-bedroom flats at Canterbury Road—S. R. Howell and Son, Ltd., 21 Minster Drive, Herne Bay, £17,867; 30-36 dwellings at rear of Sussex Gardens—R. M. Brookes, Ltd., The Square, Lenham, near Maidstone, £62,542. Work about to commence.

Newcastle-under-Lyme, Staffs.—Three bungalows at Furnace Lane, Madeley, for R.D.C. Hollins, Jones and Oldacre, architects, Lloyds Bank Chambers—Messrs. Thornhill's, Cross Heath, Newcastle Staffs., £4,411. Work commencing May 1.

Portsmouth.—Eighty-eight flats and 16 garages at Wingfield Street for City Council—John Hunt, Ltd., Cleveland Road, Gosport, £263,878 (recommended); H. E. Collins, Ltd., £269,954; Howe and Bishop, Ltd., £270,300; Jno. Croad, Ltd., £272,945; Reema Construction, Ltd., £279,693.

Scunthorpe, Lincs.—Fourteen aged persons' flats at Stockhill Road, scheme 95, for B.C.—W. and J. Sims, 35 Moorwell Road, Yaddethorpe, Scunthorpe, £20,623 (recommended), subject to Ministry approval.

Scunthorpe, Lincs.—Fourteen-storey block of 79 flats at Westcliffe housing estate for B.C.—L. H. Beal and Son, Ltd., 458a Holderness Road, Hull, £196,512.

South Cambridgeshire.—Ten bungalows, Gamlingay, for R.D.C. W. R. Hazelwood, architect—Edorn, Ltd., Hauxton, Cambridge, £12,379. Work commencing May 1.

Southgate, Middx.—Construction of four park-keepers' cottages at Broomfield Park for B.C.—Marchant Hirst and Co., Ltd., Greenwood Place, Highgate, London, N.W.5, £10,688 (recommended).

Whiston, Lancs.—Construction of pile and beam foundations at Milton Avenue, for 20 bungalows, for R.D.C.—The Pressure Piling Co. (Northern), Ltd., Charnley Fold Lane, Bamber Bridge, near Preston, Lancs.

York.—Thirty flats at Long Close Lane and 25 flats in two blocks on site 10 (Lowther Street) in The Groves redevelopment area. E. Firth, city architect, 8 St. Leonard's Place, York—J. and C. Hull, Ltd., 22 Parliament Street, York, £89,354.

MATERIALS AND SUPPLIES

Eccles, Lancs.—Supply of Dreadnought dustbins during 1961-62 for B.C.—Brettell and Shaw, Ltd., Quarry Bank, Brierley Hill, Staffs. (recommended). Estimated cost 31s. 11d. each.

Salt glazed PIPES

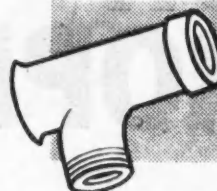
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Hastings, Sussex.—Supply of 62 tons of ½ in. and 1 ½ in. granite chippings for the 1961-62 surface dressing programme for B.C.—Amalgamated Roadstone Corporation, Ltd., 15 Stanhope Gate, London, W.1. £2 6s. 11d. and £2 4s. 5d. per ton, respectively (recommended).

Hendon, Middx.—Supply of 45,000 buff rustic facing bricks for 1 and 2 Coventry Cottages for B.C.—Henry J. Greenham, Ltd., 102 Great Russell Street, London, W.C.1, £16 10s. per 1,000 (recommended).

Stretford, Lancs.—Supply of 1,250 Dreadnought dustbins and covers, grade A, with fluted sides, during 1961-62 for B.C.—Bower Lane Manufacturing Co., Ltd., Brierley Hill, Staffs. (recommended).

PLANT AND MECHANICAL TRANSPORT

Dewsbury, Yorks.—Supply of a Dennis gully emptier for B.C.—Dennis Bros., Ltd., Woodbridge Works, Guildford, Surrey, £2,920 (recommended).

Eccles, Lancs.—Supply of a gully emptier and a battery-operated gully emptier for B.C.—Shelvoke and Drewry, Ltd., Letchworth, Herts., £3,220, and Thomas Hill (Rotherham), Ltd., 1a Effingham Street, Rotherham, Yorks., £817, respectively (recommended).

Fleetwood, Lancs.—Supply of a Dennis side-loading refuse collection vehicle for B.C.—Dennis Bros., Ltd., Guildford Surrey, £1,886 (recommended).

Middlesbrough, Yorks.—Supply of a 100ft. turntable ladder for B.C.—Merryweather and Sons, Ltd., Greenwich, High Road, London, S.E.10, £12,120 (recommended).

Newcastle upon Tyne.—Supply of two Leyland Octopus vehicles fitted with 40 cu. yd. Transport moving floor bodies for City Council—Glover, Webb and Liverside, Ltd., 561 Old Kent Road, London, S.E.1, £12,076 (recommended).

Stretford, Lancs.—Supply of a Paxit III dual-purpose refuse collection vehicle for B.C.—Dennis Bros., Ltd., Guildford (recommended). Estimated cost £965.

Wood Green, Middx.—Supply of a refuse collecting van with a moving rubber floor for B.C.—Eagle Engineering Co., Ltd., Eagle Works, Warwick, £1,436 (recommended).

PLAYING FIELDS, PARKS, ETC.

Boldon, Dur.—Grading and seeding open space Don View, West Boldon, and recreation ground, North Road, Boldon, Colliery, for U.D.C. J. T. Edmonson, surveyor—The Morgan Contracting and Engineering Co., Ltd., Fencer Hill Park, Gosforth, Newcastle upon Tyne, £900.

Hornsey, Middx.—Drainage works at the Hornsey High and Redston Road Playing Fields for B.C.—Playing Field Construction Co., 77 Lynwood Drive, Collier Row, Romford, Essex, £607 (recommended).

Tottenham, Middx.—Construction of playing areas at the Parkhurst Secondary School for Co. E.C.—Direct Labour, £10,028 (recommended).

RIVER AND FLOOD PREVENTION

Nottingham.—Bottle Brook improvement scheme for the Trent River Board—Butterworth and Partners, Ltd., Langley Mill, Nottingham, £18,027. Work has commenced.

Pontypridd, Glam.—Sheet pile coffer dams and repairs to 33in. main sewer syphon under River Taff, near Pontypridd—Davies, Middleton and Davies, Ltd., Phoenix Works, Caerphilly Road, Cardiff. Work has commenced.

ROADS, BRIDGES AND SITE WORKS

Bristol.—Provision of tarmacadam and grassed drying areas and clothes posts at rear of flats at Long Cross, Lawrence Weston, for City Council—Asphalte Specialists, Ltd., Albert Road, Bristol, 2, £3,596 (recommended).

Caterham and Warlingham.—Private street works in (a) Kingswood Lane and (b) Warren Park, Warlingham, for U.D.C.—(a) Mears Bros. (Contractors), Ltd., 154-8 Sydenham Road, S.E.26, £4,731 (accepted); Eagle Construction (London), Ltd., £4,706; Farnborough Construction Co., Ltd., £4,803. (b) Farnborough Construction Co., Ltd., Briargate, Ottershaw, Chertsey, Surrey, £6,488; Mears Bros. (Contractors), Ltd., £6,602; Eagle Construction (London), Ltd., £6,637.

Colne, Lancs.—Improvements to following for B.C.: Bends east of Monkroyd on the Colne/Keighley road, A6068—T. Turnbull and Co. (Public Works), Ltd., Simonstone, near Burnley (recommended, subject to C.C. approval).

Gibfield Road, Ellesmere Avenue, Sefton Street and Bradley Street—Bituminous Surfacing (1953), Ltd., Lime Bank, Manchester, 12 (recommended).

Dewsbury, Yorks.—Following for B.C.: Improvement of Webster Hill—Direct Labour (recommended).

Extension of St. Michael's Mount from made-up portion southwards to Gleebe Gate—John Hinchcliff and Son, Ltd., Barnsley Road, South Elmsall, Pontefract (recommended, extension of contract).

Dunstable, Beds.—Resurfacing works, Watling Street, A.5, Poynters Road and Skimpot Road for B.C. R. F. Carrington, engineer and surveyor—H. V. Smith and Co., Ltd., Walkden House, Melton Street, London, N.W.1.

Easington, Dur.—Construction of surface water sewers and site works for 50 bungalows at Peterlee for R.D.C.—Direct Labour, £2,032 and £12,983, respectively.

Eccles, Lancs.—Reconstruction of footpaths and resurfacing of carriageway at Half Edge Lane, B5229, for B.C.: George Cox and Sons, Ltd., Bolton, Lancs, £7,878, and Neuchatel Asphalte (Contracting), Ltd., Whit Lane, Salford, 6, £6,223, respectively (recommended).

Felixstowe, Suffolk.—Making-up of part of Links Avenue (approximately 192 lin. yd.) for U.D.C. A. H. Pavitt, engineer and surveyor—J. Nunn and Son, Ltd., Ipswich, £4,255 (accepted); Roadworks (1952), Ltd., £4,348; East Anglian Roadstone and Transport Co., Ltd., £4,456.

Hendon, Middx.—Resurfacing roads at Milesplit Hill, Sunbury Avenue, Sunbury Gardens, and The Vale (from Dunstan Road to Hendon Way) for B.C.—Sparkes Brothers, Ltd., Ludlow Road, Feltham (recommended extension of contract). Estimated cost £3,600.

Lanarkshire.—Fabrication and erection of footbridge at Salsburgh, on the Edinburgh-Glasgow trunk road (A.8), for C.C. T. U. Wilson, county surveyor—The Lanarkshire Welding Co., Ltd., John Street, Wishaw, £12,066.

Llandudno, Caerns.—Resurfacing Marine Drive (part) for U.D.C.—Tarmac, Ltd., Ettingshall, Wolverhampton, £2,188.

Luton, Beds.—Construction of paved footways at Lewsey estate for B.C.—C. H. Linton, Ltd., 80 Victoria Street, St. Albans, Herts., £36,287 (recommended).

Maidenhead, Berks.—Following for B.C.: Footway works at Fielding Road, Ray Mill Road West and Summerleaze Road—W. and J. Glossop, Ltd., 123 East Hill, London, S.W.18, £42,961; completion of surfacing of the central car park—T. Stevens and Sons, 62 Cox Green Road, Maidenhead, £1,484 (recommended).

Construction of a bus bay at Castle Hill—Soil Engineering and Contracting Co., Ltd., Resiliency Works, Marlow, Bucks., £6,597 (recommended, subject to M.T. approval).

Provision of access to flats at Cox Green estate (contract 5.M)—Clayton Heath, Ltd., Boyne Works, Boyne Hill, Maidenhead, £2,012 (recommended extension of contract, subject to Ministry approval).

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Newcastle upon Tyne.—Surfacing of playing field at Wharrier Street School for City Council—Limmer and Trinidad Lake Asphalt Co., Ltd., Newcastle upon Tyne, £4,189.

Norwich.—Construction of a level car park at Colegate and roads at Heartsease estate, between Woodside Road and Barclay Road, for City Council—Direct Labour (recommended). Estimated cost £4,100 and £7,000, respectively.

Nottingham.—Reconstruction of footbridge to Toton locomotive shed for the Trent River Board—Butterworth and Partners, Ltd., Langley Mill, Nottingham, £1,959.

Rawtenshall, Lancs.—Trunk road, A56—Burnley Road, Loveclough—resurfacing and reconstruction for B.C., including the re-shaping of the road surface in 2½ in. graded bituminous macadam, and providing and laying a two-layer hot-rolled asphalt surface. Approximate area of the work is 2,310 sq. yd. I. B. Burrell, borough surveyor—Val de Travers Asphalte, Ltd., Mode Wheel Road, Salford, 5, £1,696.

Scunthorpe, Lincs.—Construction of the access road and apron at Laburnum Grove for B.C.—J. R. C. McQueen, Ltd., £1,142 (recommended).

Shipley, Yorks.—Reconstruction of Stoney Ridge Road for U.D.C.—M. M. McEvoy and Son, Ltd., 50 Claremont Grove, Wrosee, Shipley. Work commenced.

Slough, Bucks.—Construction of additional roads and a new car park at Slough College of Further Education for Co. E.C.—Y. J. Lovell (Bucks.), Ltd., Marsham Lane, Gerrards Cross (recommended). Estimated cost £7,500.

Spennborough, Yorks.—Making-up of Cornmill Avenue and Cornmill Drive, Liversedge, for B.C.—S. Sutcliffe and Sons, Ltd., Mytholmroyd, £6,822.

Wellington, Northants.—Surfacing of roads, construction of footpaths and incidental works, Park Street, Poplar Place, Windmill Close, Woollaston (contract 253) for R.D.C. C. L. Hanwell, surveyor—Scuddamore and Luck, Ltd., Northampton, £4,797 (accepted); J. W. Smith, £5,073; Roads Reconstruction (Contracting), Ltd., £5,250; L. and P. Paving Co., Ltd., £5,460; R. E. Crawley, Ltd., £5,485. Work commencing April.

Wortley, Yorks.—Road improvement works as follows for R.D.C.: Fox Hill Road, Grenoside—works of reconstruction including surface water drainage—length approxi-

mately 400yd.; Middleton Lane, Grenoside—reconstruction of highway—length approximately 135yd. The work includes surface water drainage and erection of mass concrete retaining wall. Arthur Wikeley, engineer and surveyor—Pavior Construction Co., Ltd., 17 Saltire Road, Shipley, Yorks. Work commenced.

SEWERAGE, SEWAGE AND REFUSE DISPOSAL

Barnet, Herts.—Laying of approximately 3,200 lin. yd. of stoneware pipe soil and surface water sewer at Barnet Gate Lane for U.D.C.—T. Cleary and Co., 29 Elgin Avenue, Belmont, Harrow.

Chancetonbury, Sussex.—Supply of pumping plant for the Storrington main drainage scheme for R.D.C.—Tangyes, Ltd., Cornwall Works, Smethwick, Birmingham, 40, £4,960.

Cranbrook, Kent.—Construction of the Sandhurst sewerage scheme for R.D.C.—Sam. Booth, Ltd., Victoria Street, London, S.W.1, £88,704 (accepted); Mears Bros. (Contractors), Ltd., £89,900; Hugh Brown (Engineers), Ltd., £112,243, and T.H. Contractors, Ltd., £115,720.

Depwade, Norfolk.—Construction of a sewage disposal system comprising a complete works, two pumping stations, considerable length of sewers and pumping mains, and allied works, in the village of Earsham for R.D.C. J. M. Berrett, engineer and surveyor—Edward Thompson, Ltd., Eye, Suffolk, £36,191 (accepted); H. Pointer (Norwich), Ltd., £39,472. Work commencing April.

Halstead, Essex.—Construction of the Pebmarsh, Greenstead Green and Toppefield drainage schemes (contract 11) for R.D.C., comprising a total of approximately 7,300yd. of 7 in. and 9 in. diameter concrete sewers, together with manholes and other appurtenant works; approximately 270yd. of 4 in. diameter spun-iron rising main; 4 in. stoneware and 6 in. concrete lateral sewers; an ejector station at Toppefield; and at each parish a treatment works, comprising screen chamber, settlement tank, two filters, sludge beds, works pumping station, together with access road, fencing, and other incidental works. John Taylor and Sons, consulting engineers, Artillery House, Artillery Row, Westminster, S.W.1—Marshall Andrew and Co., Ltd., 40 Broadway, London, S.W.1, £97,281. Work to commence in about two months' time.

King's Lynn, Norfolk.—Re-laying part of the Saddlebow Road sewer for B.C. H. G. Ridler, borough engineer—Dredging and Construction Co., Ltd., 9 New Conduit Street, King's Lynn, £3,018; J. L. Kier and Co., Ltd., £3,102; F. W. Shanks, Ltd., £3,402. Work commencing April 1.

Lleyn, Caerns.—Sinking of trial boreholes for proposed sewerage schemes at Aber-soch and Aberdaron for R.D.C.—John Thom, Ltd., Chaddock Lane, Walkden, Lancs., £1,120.

Ludlow Salop.—Extension of 6 in. diameter sewer to Craven Arms Inn, Clee Hill, for R.D.C.—Robert Powdrill, Ltd., 61 Victoria Road, Swindon, £1,446 (accepted); Divis (Contractors), Ltd., £1,561; Thomas D. Mulcair, £1,565; Clee Hill Transport and Rolling Co., Ltd., £2,229.

Portishead, Som.—Construction of approximately 520 lin. yd. of 9 in. diameter sewer of concrete flexible jointed pipes and concrete tube manholes at Wetlands Lane for U.D.C. Harvey McGill and Hayes, consulting engineers, 38 Market Place, Chippenham, Wilts.—J. A. Venn, Ltd., 77 Ashgrove Road, Horfield, Bristol, £3,357 (accepted); E. J. Shellchake, £3,822; Durnford Construction Co. (Bristol), Ltd., £4,279; Nott Brodie and Co., Ltd., £5,097. Work has commenced.

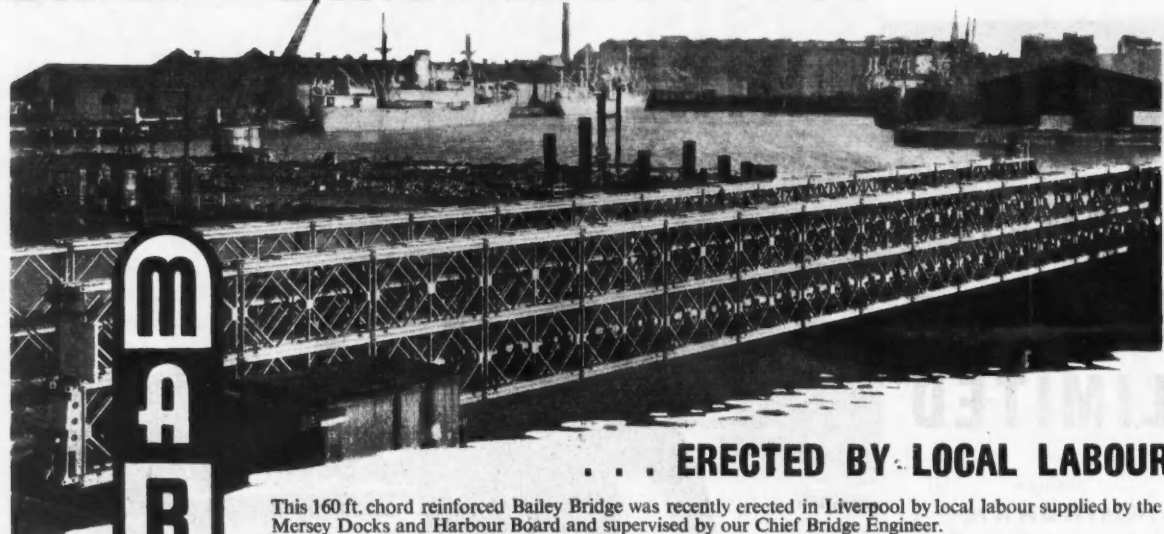
Stourbridge, Worcs.—Construction in tunnel of approximately 70yd. 12 in. and 6 in. diameter concrete and glazed stoneware pipe sewers, together with a manhole and service connections, at Birmingham Street for Main Drainage Board. John H. Haiste and Partners, consulting engineers, 10c Hagley Road, Stourbridge—R. G. Horton (Engineers), Ltd., Delph Road, Brierley Hill, Staffs., £5,494.

Weston-super-Mare, Som.—Construction of approximately 700yd. of 9 in. diameter sewer, 115yd. of 12 in. diameter sewer, 105yd. of 15 in. diameter sewer and precast concrete ring manholes at Tottordown Lane for B.C.—Harrow and Heales, Ltd., Avon House, Elmdale Road, Clifton, Bristol, 8 (recommended, subject to Ministry approval).

STREET LIGHTING

Golborne, Lancs.—Supply only of concrete and cast-iron columns, class B, totally enclosed lanterns, sodium discharge lamps and control gear for 188 lighting units for U.D.C.

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J. B. Hoyle, engineer and surveyor—Revo Electric Co., Ltd., Tipton (lanterns and gear), £1,945; Eleco, Ltd., St. Albans (concrete columns), £1,024; G.E.C., Ltd., Liverpool (cast-iron columns), £1,039.

Hornsey, Middx.—Supply of sodium lamps and jackets for the year commencing April 1, 1961, for B.C.—General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2, £5,011 (recommended).

Luton, Beds.—Supply of 140 Newbase concrete class B lighting columns for Lewsey estate for B.C.—Engineering and Lighting Equipment Co., Ltd., Sphere Works, St. Albans, Herts. (recommended).

Maidenhead, Berks.—Installation of traffic signals at Castle Hill, King Street and Marlow Road junctions for B.C.—S.G.E. Signals, Ltd., Wembley, Middx., £1,457 (recommended, subject to M.T. approval).

Whitstable, Kent.—Supply, erection and painting of tubular steel columns with 200-W sodium lanterns at Borstal Hill Roundabout, A299 for C.C.—Abacus Municipal, Ltd., Sutton-in-Ashfield, Notts.

GOVERNMENT CONTRACTS

Admiralty.—Particulars of contracts over £4,000 in value placed by Navy Works Department:

Northern Ireland: re-covering roofs—Neuchatel Asphalt (Contracting), Ltd., Belfast.

Hampshire: reroofing—Carter-Horseley (Engineers), Ltd., Crawley; recruiting office—G. E. Prince and Sons, Ltd., Southampton; boiler-house—A. E. Porter and Sons, Ltd., Portsmouth; painting—Chas. B. Dickenson, Ltd., London, S.W.1; extension to shop—R. J. Winnicott, Ltd., Portsmouth; repairs to jetties—A. E. Farr, Ltd., Westbury; extension to shop—Dibben Structural Engineers, Southampton; electrical installation—D. Aldridge and Sons, Ltd., Southampton; steelwork—Blight and White, Ltd., Plymouth.

Berkshire: painting and storage of steelwork—J. J. Hamilton and Sons, Ltd., Headington, Oxon.

Dorset: renovation of huts—Rawlings (Builders), Ltd., Poole; heating—Edward Deane and Beal, Ltd., London, E.C.4; re-roofing tanks—Whessoe, Ltd., Darlington; heating installation—Mumford, Bailey and Preston, Ltd., Bournemouth.

Air Ministry.—Contracts to the value of £4,000 or over for the week ended March 10:

Building work: Biggin Hill, Kent—Woodcock Marshall and Co., Ltd., 2 Westbourne Grove Mews, London,

W.11; Locking, Weston-super-Mare, Som.—Sir Lindsay Parkinson and Co., Ltd., 6 Lambeth Road, London, S.E.1; Cranwell, Lincs.—Bernard Pumfrey, Ltd., Wintern Works, Lea Road, Gainsborough, Lincs.

Artificers' work: Cranwell, Lincs., etc.—Bosworth Wakeford and Stepwell, Ltd., Lawford Road, Rugby, Warwick; Cosford, Staffs.—Seddon (Stoke), Ltd., 55 Duke Street, Fenton, Stoke-on-Trent, Staffs.; Norton, Sheffield—R. Green and Son (Chapel-en-le-Frith), Ltd., Market Street, Chapel-en-le-Frith, Ches.; Alconbury, Hunts.—Rattee and Kett, Ltd., Station Road, Cambridge; Manston, Kent, etc.—C. Jenner and Son, Ltd., 5-9 Bouverie Road West, Folkestone, Kent.

Central heating medium pressure hot water installations and external mains, etc.: Cranwell, Lincs.—G. N. Haden and Sons, Ltd., P.O. Box 14, 7-12 Tavistock Square, London, W.C.1.

Manufacture, supply, delivery and erection and commissioning of 11 unit-type sub-stations: Fylingdales Moor, Yorks.—The English Electric Co., Ltd., Liverpool Works, East Lancashire Road, Liverpool.

Preparation of lands: Air Ministry Directorate General of Works, Headquarters, 5 Works Area, Shippin, Abingdon, Berks. (groups 1-5), including Upper Heyford, Brize Norton, Halton, Welford and Greenham Common, Berks.—G. O. and W. L. Watts (Grazeley), Contracts, Ltd., Calcot Works, Calcot, Reading, Berks.

Ministry of Works.—Contracts placed for week ended March 4:

Aberdeenshire: Laboratory, Department of Scientific and Industrial Research, Torry, Aberdeen—extension—W. J. Anderson, Ltd., Balmoral Road, Aberdeen.

Ayrshire: Telephone Exchange, Langlands Brae, Kilmarnock—erection—T. Findlay and Son, Ltd., Horwood Place, Mauchlin; Post Office and Sorting Office, Orchard Street, West Kilbride—erection—Nairn Bros. (Builders), Ltd., 55 Main Street, Kilbirnie.

Essex: Shell Fish Research Station, Burnham-on-Crouch—construction of new store building and ancillary—F. Hodson and Son, Ltd., Orchard Street, Chelmsford.

Hampshire: Post Office Engineering Depot, Petersfield—adaptation (stage II)—S. Salter (Portsmouth), Ltd., 227-229 Goldsmith Avenue, Portsmouth.

Kent: Cobham Hall: preservation work—G. E. Wallis and Sons, Ltd., Stuart Road, Gravesend.

Lanarkshire: Post Office Telephone Engineering Centre, Drive, Drakemore, Castle-milk, Glasgow—erection of administrative block—A. M. McDougall and Co., Ltd., 24 Davaar Street, Glasgow, S.E.; Telephone Exchange, Crowlin Crescent, Cran-

hill, Glasgow—erection—Findlay and McGeechan, 1097 Tollcross Road, Glasgow, E.2.

London: Cleland House, Page Street, S.W.1—alterations to the canteen—C. J. Fisk, 49 Lincoln Road, Forest Gate, E.7.

Yorkshire: Telephone Engineering Centre, Cherry Row, Leeds—erection—F. Shepherd and Son, Ltd., Blue Bridge Lane, York.

Post Office.—Contracts for duct laying, etc., works to the value of £4,000 and over placed during the two weeks ending March 11:

Christie and Co. (Contractors), Ltd., Raemoir Road, Banchoy, Kincardine; Clark Bros., Stratton Road, Swindon, Wilts.; A. R. Cleghorn and Co., Ltd., 34-36 Harvey Lane, Norwich, Norfolk; P. Lowery and Sons, Ltd., Sussex Road, Southall, Middx.; McNicholas Construction Co., Ltd., 31a Cricklewood Broadway, London, N.W.2; The North Midland Construction Co., Ltd., Portland Works, Daybrook, Nottingham; The Norwest Construction Co., Ltd., Litherland, Liverpool, 21; Stanley Raymond and Co., Ltd., Sussex Road, Southall, Middx.; George Taylor (Wolverhampton), Ltd., The Viewlands, Cross Road, Albrighton, Wolverhampton, Staffs.; Alexander Thomson and Co. (London), Ltd., 45a Kensington High Street, London, W.8.

War Department.—Contracts placed for the week ended Feb. 24:

Berkshire (Windsor): boiler work—Stitson White and Co., Ltd., London, W.1.

Essex (Shoeburyness): bridge repairs—Carter Horsley (Engineers), Ltd., Crawley, Kent (Chatham); building—W. H. Holden, Rainham, Kent.

Lancashire (Halton): miscellaneous—Nicholson and Wright, Ltd., Lancaster.

Yorkshire (Catterick Camp): building—C. Chapleo and Sons, Leyburn; (Harrogate): miscellaneous—G. W. Ledger, Harrogate.

Contracts placed for the week ended March 3:

Hampshire (Aldershot): building—Davies and Rentow (Aldershot), Ltd., St. Albans; (Longmoor): miscellaneous—E. J. Logan (Putney), Ltd., London, S.W.15; (Middle Wallop): painting and decorating—Ian Williams and Co., Ltd., Cardiff.

Leicestershire (South Wigston): building—M. J. Gleeson (Contractors), Ltd., North Cheam, Surrey.

London (W.8): building—J. Garrett and Son, Ltd., London, S.W.12.

Nottinghamshire (Ollerton): hutting—H. Rouse and Sons, Ltd., Mansfield Woodhouse.






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Trade and Company News

PIN POINTING CAUSES OF ENGINE FAILURE

"Hardness Relaxation" Technique

A SIMPLE method for measuring the operating temperatures of engine parts like valves and pistons has been developed by scientists of "Shell" Research Ltd., at their Thornton, Cheshire, Research Centre.

The usual temperature measuring devices cannot easily be attached to these rapidly-moving parts inside the engine block, but Thornton has developed a technique whereby each component literally registers the maximum temperature to which it is exposed. When the engine is taken apart, this temperature is deciphered in the laboratory.

High temperatures can build up locally on pistons, rings, bearings, gears and valves, and if they become too high premature failure can result. As a result of this new technique engineers can now pin point these hot spots and then take steps to overcome them.

Thornton's technique, known as the "hardness relaxation" method, depends on the fact that when certain alloys are heated and then cooled, their original hardness is changed. The extent of the change depends on the maximum temperature reached. This fact in itself is not new, but Thornton has applied it to taking the temperature of moving parts in cars and in large engines used in ships and trains.

Usually it is only necessary to compare the original hardness of an engine com-

ponent with its hardness after running to determine with accuracy the maximum temperature reached in the range of 100 degrees C. to 1000 degrees C. (212 degrees F. to 1832 degrees F.). When the metal of a particular engine component is not suitable for recording accurately the maximum temperature reached, small inserts of a suitable alloy can be inserted in the part under study. The change in hardness of the insert will then give a measurement of the maximum temperature reached. Thornton has developed a wide range of alloy inserts for this purpose.

A Problem Is Solved

An interesting application of this technique helped solve the problem of a car owner in the Australian bush. The car was a make renowned for its performance and no one could diagnose why it would go for a few miles and stop.

Thornton was advised of the symptoms and the engineers there were fairly sure the spark plugs were overheating. To check their hypothesis, they sent out a set of specially-prepared plugs. These were run in the car and then sent back to the laboratory 12,000 miles away. Examination of the change in hardness of the plugs showed that temperatures in the order of 1000 degrees C. were being reached. It was a simple matter to adjust the timing to make the engine run cooler.

SPEEDIER STRESSING SETS DEVELOPED

DUCTUBE-UDALL, LTD., 64 Battersea High Street, London, S.W.11, are marketing two new stressing sets which have been developed to give greater speed when stressing Gifford-Udall tube and plate anchorages.

A compact stressing kit incorporates the 5in. extension tube jack, hand pump, pressure gauge and jack tools, while the standard kit is similar but has a 10in. extension tube jack with a larger two stage hand pump.

The Gifford-Udall tube jack, which forms the basis of these kits, may be used with 7° or 14° tube anchorages and with plate anchorages. The 5in. tube jack weighs less than 10lb. and is only 14½in. long and 2½in. in diameter.

When using the tube anchorage with 14°



A stressing kit

wedges after the required extension has been achieved it is merely necessary for the operator to release the pressure. The final wedges are then automatically locked off in the anchorage and the jack retracts leaving the temporary wedges on the end of the wire. These are removed by hand and the jack is moved to another wire ready for the next stressing operation. When using the tube anchorage with 7° wedges or the plate anchorage, an alternative nose is fitted to the jack and the operation is identical except that the wedges in the final anchorage must be tapped home with a drift tool.

The small size and light weight of the tube jack make it easier to apply to wires at close centres. The compact stressing set costs £97 and the larger set £120.

CLOSED CIRCUIT WATER CIRCULATOR

Deblorac water circulators, suitable for any small bore closed circuit operation with water temperatures up to 212 degrees F., are now being manufactured under licence for sale in the U.K. and Commonwealth by Aero Controls, Ltd., Weedon Road, Northampton.

The circulator weighs 15lb., and is glandless and self-lubricating. Overloading and overheating in the windings cannot take place even in a continuously stalled condition, it is claimed, and the unit is silent in operation.

The die cast body is of special corrosion resistant, aluminium alloy and all rotating components are pressed on to a robust annealed stainless steel shaft. The rotor is protected by a hard chromium deposit with impellor and rotor support investment cast in stainless steel.

A new method has been introduced for lubricating the bearings. Water is fed from the disc of water behind the impellor face in the pressure area. The centrifugal force resulting from the rotation of the disc rejects all foreign particles and ensures a clean water feed for pressure lubricating, eliminating the use of filters.

A bigger sized version, the Deblora, is also available for larger bores up to 150 m.m.

LIQUID DISTRIBUTION EQUIPMENT

Douglas Ellison, Ltd., 8 The Mall, London, W.5, have been appointed sole United Kingdom distributors for new liquid distribution equipment for pipelines. Comprising central control units for pipelines connecting groups of tanks, the equipment is manufactured by Alfons Haar. Maschinenbau, Hamburg-Eidelstedt, Fangedieckstr. 67.

STOCKHOLDERS VOTE "STAVELEY INDUSTRIES LTD."

At a special meeting in London last week stockholders agreed to a board recommendation that "Staveley Industries, Ltd.," should be the new name for The Staveley Coal and Iron Co., Ltd.

Mr. John P. Hunt, chairman, stated: "In 1947 and 1951 our major productive interests in coal and iron were taken over by the State and the words of the old title are no longer appropriate. The interests of the company are now so diverse that 'Staveley Industries, Ltd.' is a much more suitable name."

The 27 companies in the Staveley group now operate in three broad fields: general engineering and foundries; machine tools; salt, lime and allied products.

These companies include Amasal, Ltd., whose Decorators' Supplies Division markets the "Mangers" range of products and "Lakil" insecticidal paints.

ORDERS FOR WEATHERILL SHOVELS

A number of orders from Government departments and nationalised industry are reported by F. E. Weatherill Ltd., of Welwyn Garden City. Most recent of these is a contract from the War Office for 13 hydraulic loading shovels which are due to be delivered by mid-March.

The Central Electricity Generating Board has placed an order for three 4-wheel drive models, worth £12,000. Other recent orders have come from the Government of Ghana—two model 12H loading shovels—and the Admiralty—an S.2 loading shovel now in use at Portsmouth Dockyard.

Orders which will be going through in the near future include five for the National Coal Board.

UNDERWATER TV CAMERA SERVICE

A new service which makes use of closed-circuit television for underwater and pipeline inspection is announced by General Descaling Co., Ltd., Worktop.

Two different types of camera are employed, the great advantage of the underwater camera being its ability to "see" through turbid water. The second type of camera is explosion-proof and is primarily used in the inspection of pipelines and sewers of diameters down to 9in. This camera is either winched through the pipe or sewer or, where there is running water, floated along. A miniature version, which can also be used for borehole inspection, is available for diameters down to 3in.

Each type of camera carries its own lighting system and transmits pictures to a monitor mounted in a specially equipped inspection vehicle.

Trade and Company News

STANDARD UNITS IN NEW TWO-LAYER SPACE FRAME

A NEW two-layer space frame for flat roofs, which has a three-way grid constructed from identical lattice units with one standard type of connection plate, has recently been under test on a site at Feltham, Middlesex.

The frame, known as the Met-Ram system, has been developed by Booth and Co. (Steel Structures), Ltd., Vincent House, Dorking, in collaboration with Dr. Z. S. Makowski of the Imperial College of Science and Technology. It is a light-weight system, being built from cold rolled, cold reduced preperforated sections,

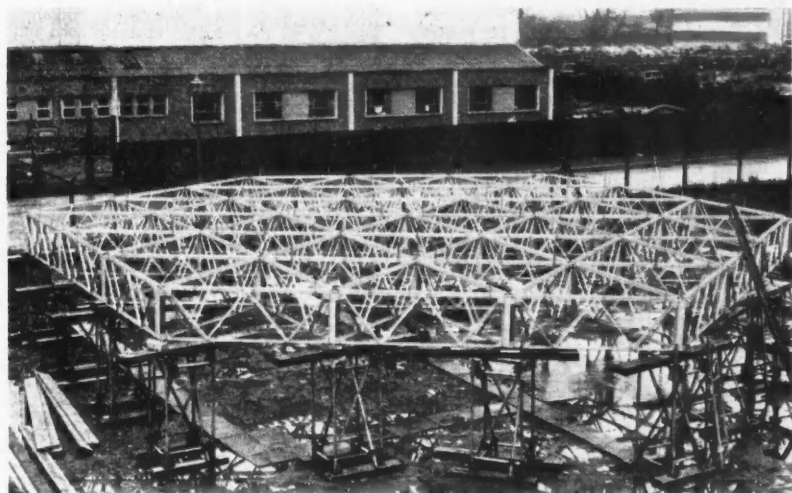
would still not exceed 100lb. and the same conditions would apply.

The field test at Feltham has been on a full-scale prototype grid of 56ft. span. Test loading showed the following results:

Self weight	4.5
Cladding	7
Superimposed load	15
50 per cent. overload	7.5

Total 34lb. per sq. ft.

Although the initial design analysis is complicated the preparation of working drawings is simple once the size of the members has been determined. It would only be necessary to prepare a typical



The prototype Met-Ram frame erected at Feltham

Variations in span can be provided by varying the length of the standard lattice unit up to the maximum loading capacity of the existing sections. The maximum span possible with the present range of section is of the order of 120ft., with a depth of 4ft. 6in.

For units suitable for roofs of 70ft. span with a depth of 3ft., the weight of a complete unit is 85lb., and all handling can therefore be carried out by hand. The only equipment needed for roofs of this span are light mobile scaffolding and suitable spanners. In the case of larger roofs up to 120ft. span, the weight of the unit

design analysis for the maximum span applicable to each arrangement of the length and depth of the standard units to be able to offer a complete range of two-layer three-way space grids of this type up to spans of 120ft., and eventually to spans of 200ft. or more. Although initial design costs are high they become low when written off over several space frame constructions requiring a large number of standard units.

The design is such that it incorporates a built-in camber for drainage purposes and is suitable for the attachment of any services.

NEW RANGE OF "GREEN SEAL" V-BELTS

Longer life, coupled with higher efficiency, the need for fewer belts and lighter pulleys on the same job, is now possible with the introduction of a new range of V-belts with higher horse-power ratings, state The Goodyear Tyre and Rubber Co. (Great Britain) Ltd., Wolverhampton.

The two new belts being introduced are: the "Green Seal" E.C. Red V-belt, dimensionally stable under all stocking conditions, with a 40 per cent. higher horse-power rating than the old standard E.C.V-belts at no extra cost; and the "Green Seal" HY-T Premium V-belt, having a 100 per cent. higher horse-power rating than the old E.C.V-belt at 25 per cent. extra cost. This latter belt is also said to be static conducting, oil-resisting and dimensionally stable under all stocking conditions.

BORE UNDER-REAMING WITH PNEUMATIC HOIST

A Joy-Sullivan AW.80 hoist has been used by McKinney Foundations, Ltd. in conjunction with sinking bored piles by the McKinney system, in which a lorry-mounted rig can sink an auger from 1ft. to 10ft. diameter to a depth of 110ft.

In soft strata, the machine can under-ream the bore to provide a greater load bearing area at the base of a pile, but hard strata makes it necessary to under-ream the bore manually, using compressed air tools.

In the latter case, men and equipment must be taken to the bottom of the bore to cut the under-reaming, clear out waste material, and inspect borehole walls. To facilitate these operations an AW.80 hoist was employed, mounted on a light, portable gantry easily man-handled over the bore when required.

DIAMOND DRILLING DIVISION FORMED

A DIAMOND drilling division has been formed by Coventry Compressors, Ltd., 32 Stewarts Road, London, S.W.8, to deal exclusively with the problems of penetrating all types of materials used in construction and installation work. Amongst the harder materials will be reinforced concrete, artificial stone, glazed wall tiles, quartz, refractory bricks, granite and marble.

By using hollow tubular steel drills tipped with industrial diamonds these materials, it is stated, can be drilled quickly and quietly. The machinery required is light and portable and is suited to work where excessive noise, dust and vibration are to be avoided. Although the equipment is portable, it is claimed that holes up to 12in. in diameter through 10ft. or more of reinforced concrete can be rapidly drilled.

Used in conjunction with a hydraulic burster, the diamond drill can be suitable for demolition of mass foundation concrete or heavy brickwork where occupied buildings are in close proximity.

Other advantages claimed for the equipment include the elimination of the risk of structural damage and the necessity of making good the drilling. A lack of fire hazard gives the equipment a particular application in connection with the petroleum, chemical and mining industries.

PARKER PLANT FOR BOLIVIA

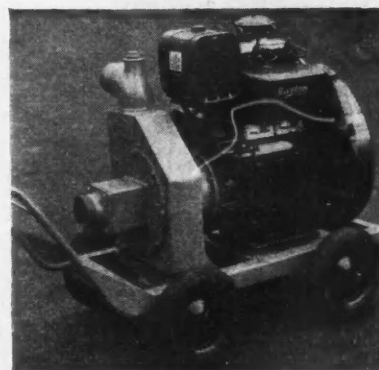
An order for mining plant to be used in the Tihua tin mines, Oruro, Bolivia, is being fulfilled by Frederick Parker, Ltd., Leicester.

The order, worth about £10,000, has been shipped in two consignments and comprises two apron feeders, a 16in. by 10in. Rocksizer crusher; an 18in. by 14in. Rollsize roller bearing crushing roll; two belt conveyors 16in. wide and 100ft. long, and two belt apron feeders, all with control gear.

BARFORD 4IN. SELF-PRIMING PUMP

Barfords of Belton, Ltd., Grantham, Lincs., have announced the addition of a 4in. model to their range of automatic self-priming pumps.

Seven versions of the new model are available, six being diesel powered and



Barford 4in. self-priming pump

one petrol. Four are rated at 30,000 g.p.h. maximum output, two at 24,000 g.p.h., and one at 20,000 g.p.h.

The units are normally wheel-mounted but are also supplied on high speed towing trailers. Each version has a guaranteed suction lift of 25ft. Prices range from £120 for the petrol version to £270 for the large diesel engine.

Trade and Company News

NEW COMPANIES

The undermentioned particulars of new companies recently registered are taken from the daily register compiled by Jordan and Sons, Ltd., company registration agents, 116 Chancery Lane, London, W.C.2:—

Green Builders, (Maidenhead), Ltd., 16 Queensway, Spencers Estate, Maidenhead. £401. Directors: Samuel E. Green, 16 Queensway, Spencers Estate, Maidenhead; Joan E. Green, address not stated.

Breakspear Contractors (Ruislip), Ltd., builders. £100. Directors: Peter B. Prowling and Leslie Eteson, addresses not stated. Subscribers: George A. Crook, 51 Caversham Avenue, N.13 (company director); Emily Faulkner, 15-17 Chichester Rents, Chancery Lane, W.C.2 (clerk).

Pritchard and Goulding, Ltd., 7a, Bath Street, Newport, Mon., builders. £100. Directors: Alan W. Pritchard, 12 Kensington Place, Newport; Keith R. Goulding, 29 Archibald Street, Newport.

Sandway Contractors, Ltd., 331 Back Broughton Terrace, Leeds, 8, building contractors. £100. Directors: Reginald A. Jefferies and Edith Jefferies, 50 Gledhow Wood Grove, Leeds, 8.

T.P. Builders, Ltd., 13 Ashfield Road, W. £2,000. Directors: Thomas P. Jones and Mrs. M. G. Jones, 13 Ashfield Road, W.3.

W. Plumpton (Demolition), Ltd., 29 Forfar Road, Fulwell, Sunderland. £1,000. Directors: Wm. Plumpton and Mrs. A. Plumpton, 29 Forfar Road, Sunderland.

Burnell and Son, Builders (Bristol), Ltd., Grove House, Highridge Green, Bishopsworth, Bristol, 3. £1,000. Directors: Sidney G. Burnell and Raymond S. Burnell, Grove House, Highridge Green, Bishopsworth, Bristol, 3.

E. and H. Everest, Ltd., 199 Piccadilly, W.1, builders. £1,000. Directors: Edward F. Everest, 19 Haslemere Road, Thornton Heath; Harold C. Everest, 121 Tollers Lane, Old Coulsdon.

J.B.N. (Builders), Ltd., 249 Hampton Road, Ilford. £500. Directors: James Hammond, 21 Norfolk Road, Barking; Brian H. Beckwith, 249 Hampton Road, Ilford; J. N. Hammond, 127 Salisbury Avenue, Barking.

Walter Martin (Builders), Ltd., Corner Bungalow, Eastwoods Road, Hinckley, Leics. £2,000. Directors: Walter Martin and Mrs. B. Martin, Corner Bungalow, Eastwoods Road, Hinckley.

A.F.C. and Son (Builders), Ltd., 60 Highfield Way, Rickmansworth. £200. Directors: Arthur Cox and Sarah Cox, 60 Highfield Way Rickmansworth.

C. H. Best, Ltd., builders. £100. Directors: Cyril H. Best and Gladys E. Best, addresses not stated. Subscribers: Gordon G. Barnes, 1 Town Hill Cottages, West Malling, Kent (clerk); Herbt. H. J. Coggins, C.A., 25 Orchard Close, New Barn, Longfield.

Kille and Noakes, Ltd., Broad Street, near Guildford, builders. £1,000. Directors: Alfred F. Kille, Dunmore Lodge, Broad Street, near Guildford; Mary E. Noakes, Covey Cottage, Merrow, near Guildford.

John Swale, Ltd., Henshaw Lane, Yeadon, near Leeds, builders, public works contractors. £2,000. Directors: John Swale, 24 Fieldhead Road, Guiseley; Derek A. Smith, Dormers, Shaw Lane Gardens, Guiseley.

Lacey and Young, Ltd., 5 Old Steine, Brighton, 1, builders. £1,000. Directors: Peter A. Lacey, 3 Tumulus Road, Saltdean; Harold H. Young, 29 Court Old Road, Rottingdean.

Alan J. Moss, Ltd., 8 Grand Drive, Leigh-on-Sea, builders. £2,000. Directors: Alan J. Moss and Molly Moss, 8 Grand Drive, Leigh-on-Sea.

Carr McKay and Co., Ltd., 27 Berkeley Road, Coventry, builders. £100. Directors: Donald C. McKay and Jean E. McKay, 27 Berkeley Road, Coventry.

R. A. Moor (Contractors), Ltd., 2-10 Palmers Lane, Enfield, builders and contractors. £100. Director: Ronald A. Moor, 48 Gladstone Road, Hoddeston, Herts.

Barrett Construction Co., Ltd., The Works, Gable Head, Hayling Island, builders, etc. £1,000. Permanent directors: Stephen G. Barrett and Dorothy B. Barrett, 30 Sandy Beach Estate, Hayling Island.

Barrett (Plant Hire), Ltd., Other details are similar to Barrett Construction Co., Ltd.

H. A. Cox, Ltd., Longdale Lane, Linby, Notts., quarries, etc. £5,000. Directors: Horace A. Cox and Mary Cox, 24 Lady Bay Road, West Bridgford, Nottingham.

Edwards and Tilbury, Ltd., 31 Great Goodwin Drive, Merrow, Guildford, builders. £100. Permanent directors: Raymond Edwards, 6 Mano Road, Guildford; Lionel G. Tilbury, 31 Great Goodwin Drive, Merrow.

Crescent Builders (Newport, Mon.), Ltd., 44 Somerset Road, Newport. £100. Permanent directors: Herbert R. Nock and Mrs. E. A. Nock, 44 Somerset Road, Newport.

Geoffrey A. Jarvis (Hire), Ltd., 9 Liverpool Gardens, Worthing. To manufacture, repair, hire and deal in plant, machinery and tools in connection with private or public works, etc. £100. Directors: Raymond J. Jarvis and Mrs. Dorothy A. Jarvis, Whylands, Durrington Hill, Worthing; Geoffrey A. Jarvis, Modene, Whylands Close, Ivydene Avenue, Durrington, Worthing.

TRADE NEWS IN BRIEF

Walter Carson and Sons, Ltd., Lombard Road, Battersea, London, S.W.11, are marketing a smaller colour dispenser, offering a reduced range of colours, but still within the overall Spectromatic colour programme.

Nash and Thompson, Ltd., Hook Rise South, Tolworth, Surrey, announce that they are marketing a wide range of creep and rupture testing machines, furnaces and extensometers, based upon equipment previously supplied against special requirements.

A seven-page pamphlet dealing with granolithic concrete has been published by **The British Granite and Whinstone Federation**, 55 Pall Mall, London, S.W.1.

A new leaflet on "Crompack" fluorescent fittings, announced by **Crompton Parkinson, Ltd.,** London, W.C.2, provides a comprehensive reference for the full range of reflectors, diffusers and tramed louvers that may be attached to the "Packs."

New brochures describing their Nu-Lyne sectional buildings and mobile site accommodation have been published by **I. Clifton and Sons, Ltd.,** 13 Neeld Parade, Wembley, Middx.

Scaffolding (Great Britain), Ltd., have placed a £90,000 order for an I.C.T. 1301 computer with ancillary data processing equipment, which is to be installed at their head office at Mitcham, Surrey.

United Dominions Trust opened a new branch office in Bradford on Monday, March 13, at 33 Kirkgate, Bradford, Yorkshire (Tel.: Bradford 24172/4).

The new address of **Land Drainage, Ltd.,** is Naas Road, Clondalkin, Dublin. Tel. 342696.

Shires of Guiseley have opened a trade showroom and sales office at 137 Victoria Street, London, S.W.1.

Field-Davis, Ltd., announce that their new address is Harwood House, 683 High Road, Finchley, London, N.12. Tel.: Hillside 2221-3.

The Ipswich office of **British Insulated Callender's Cables, Ltd.,** has moved to 1 Benet Street, Tel.: Ipswich 57265.

A private exhibition of the products of **Cufflin Holdings, Ltd.,** is now on tour until the end of April, and will be visiting Manchester, Glasgow and Newcastle upon Tyne.

Thompson Brothers (Bury St. Edmunds), Ltd., have moved their workshops and offices to 7 St. Andrew's Street North, Bury St. Edmunds.

A copy of their 1961 trade catalogue has been received from **Arthur Sanderson and Sons, Ltd.,** Berners Street, London, W.1.

Enfield Rolling Mills, Ltd., Brimsdown, Enfield, have published a new brochure on ERM resistance welding electrode materials.

Ramsay Ladders, Ltd., Forfar, Angus, have established a wholesale supply depot at Park Royal Goods Yard, Coronation Road, London, N.W.10. Tel.: Elgar 4141.

J. E. Lesser and Sons, Ltd., manufacturers of "Middlesex" prefabricated buildings, at Hounslow, are changing their name to "Middlesex Prefabricated Buildings" from April 1. J. E. Lesser and Sons, Ltd., will now become the holding company for the Jel Group, and will in future be known as **J. E. Lesser and Sons (Holdings), Ltd.**

A new branch has been opened by **Bowmaker, Ltd.,** at 134 Bartholomew Street, Newbury, Berks. Tel.: Newbury 3281.

Goodwin Bardsby and Co., Ltd., Leicester, have produced two illustrated booklets dealing with Acme roller-bearing granulators and Acme roller-bearing stone crushers.

A 36-page illustrated booklet, entitled *Fine Steels* (Publication No. 463), has been published by **Hadfields, Ltd.,** East Hecla Works, Sheffield, 9.

Croda, Ltd., Cowick Hall, Snaith, Goole, Yorks., have published a technical data sheet on their Dricote temporary rust preventive.

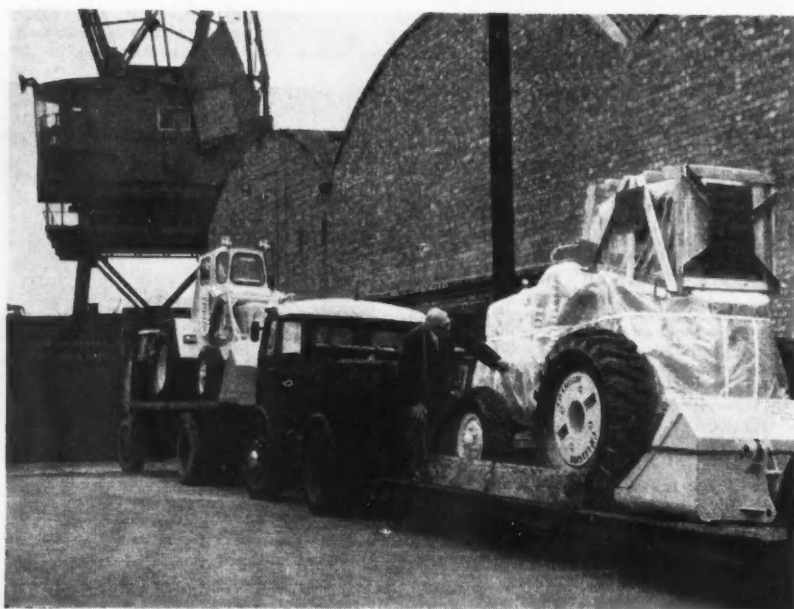
An illustrated catalogue on the various types of diffuser in the Airmaster range has been issued by **Fairitt Engineering Co., Ltd.,** 101 Sandford Road, Moseley, Birmingham, 13.

COMPANY RESULTS

Scaffolding Great Britain (Holdings). Group profit for year ended Sept. 30, 1960, £770,944 (£729,297). Final dividend 12½ per cent., making 20 per cent., an increase of 2½ per cent.

Amalgamated Roadstone Corporation, Ltd. Group profits for the year ended Oct. 31, 1960, £787,846 (£638,062). Profits after taxation, etc., £426,458 (£358,204). Recommended final dividend 7½ per cent., making 12½ per cent. for the year.

Newton Chambers and Co., Ltd.—Consolidated trading profit for 1960, £1,626,003 (£1,404,711). Net profit after tax, etc., £618,001 (£558,097). Final dividend 12 per cent., making a total of 20 per cent. for the year (17½ per cent.).



A number of Chaseside loading shovels are being exhibited at the Vienna Spring Fair this year. Here, down at London Docks just prior to their departure, Mr. J. E. T. Watson, a director of Chaseside Engineering Co., Ltd., is seen making a final personal inspection of the general finish of one of the machines.

NEW ORDERS FOR CONSTRUCTION WORK IN FOURTH QUARTER OF 1960

Record Figure Equalled

ORDERS to the value of £473 million were obtained by contractors in the construction industries during the fourth quarter of 1960, according to figures compiled by the Ministry of Works. This equals the figure reached in the first quarter of 1960, the highest since the series was started in 1956.

Orders for new housing work increased by £16 million compared with the previous quarter. This also was the highest figure since the series began except for the first quarter of 1960 when orders were abnormally high. Orders for work for public authorities increased by £13 million; this figure, however, includes one very large contract. Orders for industrial building have shown a steady rise during the year but there was no change in the total value of orders for non-housing work in the private sector obtained in the fourth

quarter because orders for other private building dropped a little.

Taking the year as a whole the value of new orders obtained in 1960 was £1,842 million, which was £256 million more than in 1959, while the value of new work carried out by contractors in 1960 was only £140 million more than in 1959. It must be expected, therefore, that the level of activity during 1961 will remain high.

Orders for public authority housing were virtually the same as for 1959, but orders for houses for private developers increased by over £40 million. The total value of work done on housing increased by over £60 million compared with the previous year so that the amount of work outstanding on housing has decreased. Meanwhile new orders for other types of work rose by £212 million and the value of work done rose by only £78 million so that the work outstanding in this sector rose.

Value of New Orders Obtained by Contractors

	3rd Quarter (in millions)	1960 4th Quarter (in millions)	Total 1959 (in millions)	Total 1960 (in millions)
New Housing				
For Public Authorities	65	69	255	257
For Private Developers	110	122	435	477
Housing Total	175	191	690	734
Other New Work				
For Public Authorities	112	125	427	489
For Private Developers:				
Industrial	82	85	241	341
Miscellaneous	75	72	228	278
Other New Work Total	269	282	896	1,108
Total All New Work	444	473	1,586	1,842

"URBAN MOTORWAYS FOR LONDON," SAYS MIDDLESEX COUNTY ENGINEER

ANOTHER plea for urban motorways and improved trunk roads to serve Greater London was made last week by Mr. H. S. Andrews, county engineer and surveyor of Middlesex, when he addressed the All-Party Roads Study Group in the House of Commons.

He also advocated a new road-traffic committee for Greater London established on the lines of the Nugent Committee whose recommendations for a £200 million, 20-year road development programme for the L.C.C. area have recently been accepted. Mr. Andrews's suggested committee would comprise all Greater London's local authorities.

"I have no doubt that the public will welcome far more advanced proposals and there is a real need for a comprehensive, up-to-date plan and detailed programme for perhaps a 10-year period," he added.

Urban Motorways

"Primary approach roads to London should be motorways," he said. "In the suburban areas they must necessarily be new roads because it would be impracticable to convert existing roads to motorway standards."

"It will be apparent that if they are to be efficient the points of connection to the ordinary road system must be few and accordingly a large volume of traffic originating or terminating in the fringe area will be left on the existing trunk road system," he added.

Describing his ideal of a modern all-

purpose trunk road he said they should be dual carriageways without "U" turn points between major intersections; all-in roundabout and flyover at junctions; pedestrian guard fences along the entire central island; pedestrian subways and either special service road or extensive lay-bys.

Referring to the difficulties of co-ordinating road plans among the handful of authorities serving Greater London, Mr. Andrews said: "If such a committee had been sitting its experience would have been of considerable assistance to the Royal Commission on Local Government in Greater London."

SCHOLARSHIP AWARDS IN ARCHITECTURE

The Council of The Architectural Association announce the following awards to senior students at the A.A. School of Architecture:

Imperial Chemical Industries Travelling Scholarship, value £250, has been awarded to Mr. John Corrie to enable him to make a special study of the decoration of Norwegian timber buildings from the tenth to the eighteenth century.

The Building Centre Scholarship, value £100, has been awarded to Mr. D. P. Amies who will make a special study of machine-made surfacings used repetitively to form a larger element.

WORK STUDY IN THE BOROUGH ENGINEER'S DEPARTMENT

MR. E. A. CARR-HILL, chief work study officer of the British Productivity Council, gave case histories to a conference for local government officers in London last week. The conference was organised by the Croydon District Productivity Association. Mr. Carr-Hill explained how the principles of work study are by no means confined to the shop floor but can be applied, in a local authority, to a wide variety of activities such as refuse collection, road mending, street cleansing, house repairs and even the collection of cash for deck chairs.

Concentrating on the Borough Engineer's Department, he gave a number of examples of how work study had enabled the same amount of work to be done with far less effort, which is the basic principle of productivity. Mr. Carr-Hill stressed the importance of collecting all the available background and data to any operation, and this may well mean going back a number of years in order to get at the true facts. This is particularly true where seasonal work is involved.

Allowing For Future Policy

Nor must future policy be neglected. For instance, any survey of the work of refuse collection must take into account future building programmes to allow for an extension of the service.

Mr. Carr-Hill outlined a recent survey of building maintenance, which resulted in a saving of 25 per cent. of the time involved. Background data in this case included such items as the number, age, type and size of houses, the normal rotation of the maintenance programme, the available equipment and transport. This was primarily concerned with manual labour, thus emphasising the importance of the human factor in all such surveys.

Problem Of Wasted Effort

Most jobs contain elements of working, walking and waiting, and here a statistical approach can be most valuable. The work study man must often ask himself: Is this journey really necessary? In case after case Mr. Carr-Hill was able to cite examples of wasted effort.

Earlier in the conference Mr. G. H. Simmons, a divisional director in consultancy of S. J. Noel-Brown and Company Ltd., had outlined the scope of work study and the basic pattern of its operation, and Mr. Noel-Brown himself gave the final talk, in which he presented comparative studies of surveys carried out in various departments of authorities of all sizes.

The conference chairman, who wound up the day on the note "Where do we go from here?", was Mr. R. E. Griffiths, secretary of the Local Authorities Conditions of Service Advisory Board.

STANDARD LIFE-TAYLOR WOODROW LINK

A joint company has been formed between the Standard Life Assurance Co., and Taylor Woodrow Ltd., to be known as S. T. W. Developments Ltd., for the purpose of acquiring suitable developments in London and the provinces. Shops, offices, residential and possibly industrial schemes are the type of developments in mind.

The directors are: Mr. G. P. S. Macpherson and Mr. F. S. Jamieson of Standard Life Assurance Co., and Mr. G. E. North and Mr. G. W. Raybould of Taylor Woodrow Group.

Mr. Macpherson is chairman and Mr. North managing director of the new company, whose head office is at 10 Park Street, London, W.1.

Talking of Safety

by

"DRAGEE"

TOGETHER we walked across the muddy site, skirting the puddles, and sloshing ankle deep through well-churned Yorkshire clay.

"Last year we had five degrees of frost," said Roy Greenfield, the agent. "It followed the rain and the chaps were sliding all over the place. We put down cartloads of sand but we still had casualties."

"This stuff's pretty trecherous," I said.

"It's softer to sit on," said Roy. "It reminds me of the time we had a load of bigwigs from one of the Ministries, and for about a week before the big day I couldn't get into my office for bosses. On the morning of the visit it started to pelt with rain, and the chief told me to lay some kind of surface over the space we'd reserved for the cars. There was no material on the site at the time, so we sent round to the gasworks next door for a few loads of coke breeze. We put it down pretty thickly and it looked all right, so then we laid a path to the reception place, and waited for the guests. Ten minutes before they arrived old man Moody gave me the tip-off that one of the Ministry people had something to do with fuel conservation, so would I please shovel up the top dressing and hide it somewhere."

"We worked like crazy and just made it by the time they got to the gate. The visitors grumbled a bit about the state of the ground, then one of the top brass turned to Josh Moody and said 'I see you're near the gasworks. Why don't you get a load of breeze for your roadways? Makes a good surface in this kind of weather—non-slip, you know.' I never did find out whether he was the fuel conservation man or not."

On the way over, we picked up the foreman, Jack Jones. I told him what I had come about, and we walked towards the tower crane. The driver was in the lower cabin testing the controls.

"There's a heck of a draught blowing through those side openings," said Jones. "I've put a tarpaulin over them for the time being, but that'll have to come down when we start working. We might get some perspex windows put in."

"What about heating?" I asked.

"There's bottled gas laid on, with a heater in each cabin," said Roy. "Our driver believes in comfort."

"So do I," I replied. "You can't expect a man to work a thing like this properly when he's half frozen."

"Dragee," who is a practising safety engineer, would welcome subjects for discussion in this column. All names of persons mentioned in these discussions are entirely fictitious. Questions of law are expressed as the author's personal opinions and are not claimed to be authoritative.—EDITOR.

We climbed up to the cabin. The access was reasonably good, although the headroom at the entrance was unnecessarily restricted, and there was a sharp protruberance at shin level nicely adjusted to inflict the maximum amount of injury to the man in a hurry. The control gear was all in accordance with the best practice. The levers were clearly labelled and within easy reach of the operator. I was also pleased to note our standard signals chart mounted on the panel facing the driver, and similar placards fitted outside the cabin, together with tables of loads for double-leg slings.

The crane had a luffing jib, and we went round to inspect the load-radius indicator. This was a vertical indicator with a pointer between the safe working load and radius scales, actuated by a single rope and pulley arrangement.

"Some of these indicators seem to be a bit misleading," I said. "The ordinary pendulum type often has the load marks opposite the radius marks, something like this" I took a piece of chalk out of my pocket and drew the following little scale on a piece of steel plate.

Radius	20'	25'	30'
SWL (tons)	3	2	1

"Now this is the tricky bit," I went on. "Look at the 2 ton mark at 25ft. radius. Where does it end? Does it begin at 20ft. and end at 25ft. or does it begin at 25ft. and end at 30ft.?"

Jones opened his mouth, then closed it again. I guessed he was about to commit himself, but had thought better of it.

"Yes, I see what you mean," said Roy. "Obviously, if the loading changes continuously along the scale it will decrease gradually from 3 tons to 2 tons between 20ft. and 25ft. and from 2 tons to 1 ton between 25ft. and 30ft. But I agree it can be misleading to the man who's got other things to think about."

"There's another difficulty," I said. "With horizontal jib tower cranes the loads and radii are usually marked with a series of signals, and the safe working loads go down in steps. That's where more confusion arises. The only practical solution, as I see it, is to omit the radius scale altogether. If you must have the radius marks they should be spaced between the radius marks, like this"

Radius	15'	20'	25'	30'
SWL (tons)	3	2	1	

"It's right enough," said Jones. "I've heard crane drivers complaining about these things being different on each type of machine. And another thing. Both the driver and the slinger should be able to see the scales clearly, but they're not always easy to read."

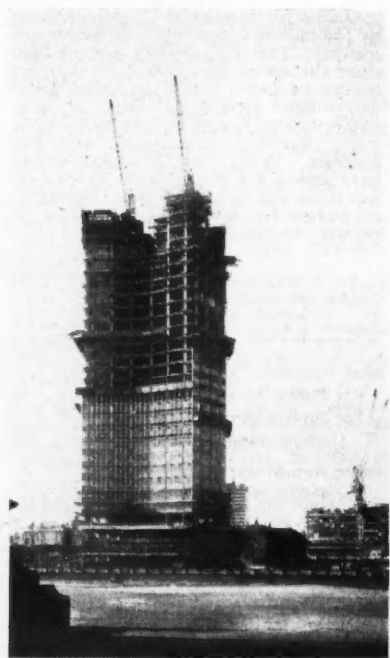
Roy looked at me and smiled.

"You seem to have started something," he said.

"BUILDING IN THE 'SIXTIES" EXHIBITION

THE exhibition "Building in the 'Sixties" will be officially opened at the Guildhall, London, by Alderman Sir Frank Newson Smith at 12 noon on Monday March 27. It will then be open from 2.30 p.m. that day until 6.30 p.m. Thursday March 30.

The exhibition is designed to show the trends operating in present-day architecture and construction. At the start of this new decade it has become noticeable that much of the most important work is being designed in structural concrete. These outstanding jobs include redevelopment work



Millbank development scheme

in London—the City's Barbican scheme and the L.C.C.'s Elephant and Castle scheme; two new cathedrals—Coventry and Liverpool; the Queen's bridge, Perth; the New Zealand Government's London headquarters; the new Commonwealth Institute; the tallest office block in Britain—the Millbank development scheme; and one of the country's most advanced factories—Texas Instruments' factory at Bedford. Fourteen jobs of this calibre are being featured in the exhibition.

At the same time the exhibition shows leading concrete buildings and structures of the '50s which led up to this development, and also includes a section on new techniques in construction and, more particularly, in surface treatments of concrete which, it is claimed, can now give it a finish able to hold its own with that of any other material.

LACK OF UNIFORMITY

Confusion is arising over the lack of uniformity in the use of the solid yellow line, according to Traders' Road Transport Association, the C licence operators' body.

Goods vehicles drivers are particularly concerned. Generally speaking the line painted on the carriageway indicates a prohibition of waiting and loading and unloading, but in some cases it has been used with a different meaning.

The matter has been taken up with the Ministry of Transport, and the T.R.T.A. is asking members if they know of cases where the line is being used for other purposes to forward details.



EASTERN REGION RAILWAY MODERNISATION AT COLCHESTER

100ft. Girders for Dive-Under Line

THE Eastern Region's rail speed-up plans for the East Anglian main line took another step forward last week when two 100ft. girders for a new bridge over the Colchester "dive-under" line arrived at the site.

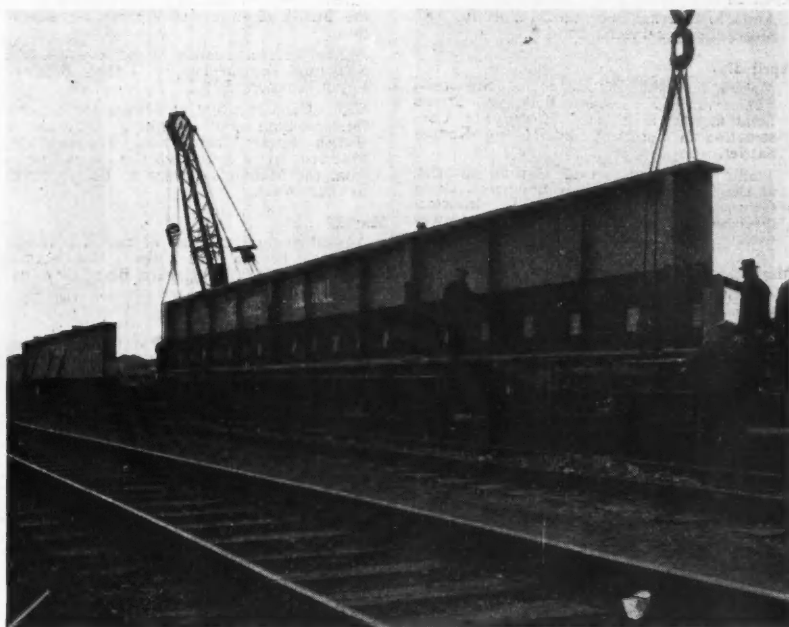
Believed to be the longest ever made in the London area, the new 40-ton girders have been brought from the Millwall works of the bridge builders—Joseph Westwood and Co., Ltd.—by road and rail.

The new bridge is one of the chief features in a big programme of track work now being carried-out in connection with the complete reconstruction of Colchester station. When work is fully completed—sometime in 1962—main line trains in the area will be able to reach speeds of up to 90 m.p.h. The bridge will carry trains on the Norwich main line over the new 1200-yard-long dive-under line—which is being specially constructed to serve Clacton-bound trains.

The new bridge will be a heavily-skewed two-track structure, consisting of two welded steel main girders and a deck of steel joists encased in concrete. The main girders have a span of 95ft. and an overall length of 100ft. They are placed at 29ft. centres.

To facilitate the construction of the abutments and wing walls, the District Engineer for the area has already placed way-beams over the locations of the abutments, enabling the contractors, The Cementation Co. Ltd., to excavate in a trench under traffic. The concrete wing walls and abutments—each abutment supported by 40 piles—will then be built, also under traffic.

A temporary staging will be erected alongside the site of the bridge and the main girders and deck assembled there. When all is ready, the entire deck, ready ballasted and weighing approximately 540-tons, will be rolled into position. This operation is expected to take place in May of this year.



Girders being rail-loaded at Chadwell Heath

THREE HOTELS IN EIRE TO COST \$7M.

INTERNATIONAL Hotels Corporation, New York, have announced plans for the construction of three hotels in Eire—at Dublin, Limerick and Cork—to cost about \$7 million.

The Dublin hotel will be an eight-storey, 320-room structure, and will cost over \$4 million, while the projects in Limerick and Cork will be 96-room motor inns, costing about \$1½ million each. Preliminary designs for all three buildings have been prepared by the American architect, William B. Tabler.

Features of the Dublin building will include an Olympic-size outdoor swimming pool and a cocktail lounge on the hotel roof. All rooms will have private baths and all the public rooms will be air conditioned. Dining facilities will include a main dining room, a grill and a smaller restaurant, and a ballroom accommodating 500 persons for a banquet and 700 persons for a conference. Parking facilities will be provided for at least 250 cars.

The two motor inns will be similar in design, and will consist of twin two-storey guest-room buildings, each containing 48 rooms. All public and service facilities will be concentrated in a core building comprising a restaurant, bar and lounge and the ancillary hotel service facilities. Both inns will have large outdoor swimming pools.

STAINLESS STEEL EXHIBITION

A public exhibition of stainless steel products is now being staged at the Mayfair Rooms, Bryanston Street, London, W.1, by the Stainless Steel Manufacturers' Association. It will remain open until May 4. One exhibit is a large photograph of the new Vickers building on Millbank—London's first block using stainless steel curtain walling.

STANDARDS ENGINEERS' ANNUAL CONFERENCE

THE seventh annual conference of engineers and others concerned with the application of standards, is being held this year on May 9 and 10 and will be opened by Viscount Hailsham, Lord President of the Council and Minister for Science.

These conferences have attracted increasing interest over the past years and have provided a valuable opportunity for discussion and exchange of experience among standards personnel from a growing range of industries. They have also led to the creation of the new "Register of Standards Associates" under the aegis of the B.S.I., and the programme committee of the Register has been active in the planning of this forthcoming seventh conference. It has been decided this year to hold a two-day meeting, with parallel sessions on the second day, to give greater opportunity for detailed discussion.

The first day of the conference will consist of plenary sessions at the Connaught Rooms, London, when Sir Stanley Harley (Coventry Gauge and Tool Co., Ltd.) will take the chair. After the formal opening by Lord Hailsham, a contribution on the trades union viewpoint on industrial standards will be given by Mr. G. Doughty of the Association of Engineering and Shipbuilding Draughtsmen. Papers will also be given on An Integrated Standards Programme in the Company (Mr. F. E. Butcher, of Joseph Lucas Ltd.), Standards in Product Development (Electronics) (Mr. D. F. Egan, of Mullard Ltd.) and Standards in Market Research and Sales (speaker to be announced).

The second day's programme, to be held at British Standards House, will consist of three parallel sessions in the morning and three in the afternoon, to discuss in smaller groups various topics, including: The application of a standards system in a smaller company; Steel—variety reduction by manufacturers and users; Standardization in fields where techniques are advancing rapidly; Standardization in a 1-off and batch production company; The Unified screw thread in British industry.

REGIONAL TECHNICAL COLLEGES

The list of regional technical colleges in England and Wales is to be revised and a new list designated. In a circular to local education authorities Sir David Eccles, Minister of Education, explains that up to April, 1959, regional colleges were, in effect, identified with those colleges receiving a special grant for courses in advanced technology. This test is no longer applicable, says the Minister, and it is necessary to review the list of regional colleges and to decide how far it continues to be appropriate in view of recent and prospective developments at the individual colleges and in the regions generally.

Decisions on the colleges to be designated in the revised list will be taken after consultations with local education authorities and the regional advisory councils. It is not the Minister's intention to fix now for all time the list of regional colleges. The list will be revised again in the future if at any time it appears desirable in view of changed circumstances. Colleges of art or colleges of commerce will not be affected.

Obituary

It is with regret that *The Contract Journal* records the death of the following:

Mr. Joseph D'Arcy, aged 55, engineer to Portrush (Antrim) U.D.C. He was for 10 years engineer to the former Coleraine, Portrush and Portstewart Joint Water Board.

Mr. A. O. Adcock, aged 72, former surveyor to Louthland (Suffolk) R.D.C.

Mr. C. H. Uines, contract manager of Anglo-Scottish Construction Co., Ltd., London, S.W.20. He had been with the company since 1934.

FOR THE DIARY

March 23

Traffic Engineering Study Group meeting at the Institution of Civil Engineers, Great George Street, London, S.W.1. Informal discussion—traffic engineering problems on motorways between cities and airports in France—introduced by H. Grimond.

Meeting of the Institution of Structural Engineers, 11 Upper Belgrave Street, London, S.W.1, 6 p.m. "Rubber Tyred Overhead Cranes—Their Influence on the Design of Industrial Buildings", by E. M. Lewis.

April 4

Meeting of the Manchester and District branch of the Contractors' Mechanical Plant Engineers, The Woodcourt Hotel, Brooklands Road, Sale, Cheshire, 7.30 p.m.

April 5

North West branch of the Contractors' Mechanical Plant Engineers, Stag Hot-Pot Supper, Reece's, Clayton Square, Liverpool. Tickets from committee members.

April 6

Meeting of the Yorkshire branch of the Contractors' Mechanical Plant Engineers, Metropole Hotel, Leeds, 7.30 p.m.

Meeting of the London branch of the Contractors' Mechanical Plant Engineers, Hendon Way Hotel, Hendon Way, N.W.4, 7.30 p.m.

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.1. "River Utilisation and the Preservation of Migratory Fish Life," by G. Baxter.

April 7

Meeting of the Institution of Highway Engineers at 11 Upper Belgrave Street, London, S.W.1, 5.30 p.m. "Standards of Design for Rural Roads", by I. A. Cram.

April 8

Annual general meeting of the Institute of Sewage Purification (Metropolitan and Southern Branch) at Friends House, Euston Road, London, N.W.1, 11 a.m., followed at 3 p.m. by talk: "Sewage Disposal in Russia," by D. A. H. Price.

April 10

Meeting of the Hants. and Sussex branch of the Contractors' Mechanical Plant Engineers, Black Dog Inn, Emsworth, 7.30 p.m. Discussion on insurances and safety precautions.

April 11

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.1. "Recent Works on the Canal System of B.T.C. and Planning for the Future," by V. H. Tripp.

April 13

Graham Clark Lecture at the Institution of Civil Engineers, Great George Street, London, S.W.1. "Resources, Human and Material, of the Commonwealth," by H.R.H. The Prince Philip, Duke of Edinburgh.

April 18

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.1. "The Use of Specialised Plant in Airfield and Road Construction," by E. U. Broadbent and M. A. May.

April 19

Quantity Surveyors General Meeting, R.I.C.S., London, 6 p.m. "The Use of Cost Prediction as a Guide to Planning and Design," by P. A. Stone, M.Sc.(Econ.), of the Building Research Station.

April 20

Traffic Engineering Study Group meeting at the Institution of Civil Engineers, Great George Street, London, S.W.1. Informal discussion—traffic planning and design of roads in Cumbernauld New Town—introduced by G. P. Crow.

April 25

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.1. "The Inner Ring Road, Birmingham," by Sir Herbert Manzoni.

April 26

Annual meeting of the Institution of Mechanical Engineers, London.

April 27

Meeting of the Institution of Structural Engineers, 11 Upper Belgrave Street, London, S.W.1, 6 p.m. "Composite Construction in Germany," by Dr. Ing. Konrad Sattler.

Traffic Engineering Study Group meeting at the Institution of Civil Engineers, Great George Street, London, S.W.1. Informal discussion—safety aspects of motorway design—introduced by W. F. Adams.

May 2

Annual general meeting of the Manchester and District branch of the Contractors' Mechanical Plant Engineers, Woodcourt Hotel, Brooklands Road, Sale, 7.30 p.m.

Annual general meeting of the Manchester and District branch of the Contractors' Mechanical Plant Engineers, The Woodcourt Hotel, Brooklands Road, Sale, Cheshire, 7.30 p.m.

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.1. "New Tunnels near Potters Bar in the Eastern Region of British Railways," by A. K. Terris and H. D. Morgan.

May 3-4

Railway Modernisation Conference held jointly with the Institution of Mechanical Engineers and the Institution of Electrical Engineers at the Institution of Civil Engineers, Great George Street, London, S.W.1.

May 4

Meeting of the London branch of the Contractors' Mechanical Plant Engineers, Hendon Way Hotel, Hendon Way, N.W.4.

May 9

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.1. "Auckland Harbour Bridge," by G. Roberts and O. A. Kerensky, who will discuss the design, and H. Shirley Smith and J. F. Pain, who will discuss the construction.

May 11

Joint meeting of the Institution of Civil Engineers with the Institute of Landscape Architects at Great George Street, London, S.W.1. "Collaboration between Engineers and Landscape Architects," by C. S. Chettloe and G. A. Jellicoe.

May 16

Meeting of the Institution of Civil Engineers, Great George Street, London, S.W.1. "St. Lawrence Power Project—Hydraulic Features," by O. Holden.

May 18

Annual dinner of the Institution of Civil Engineers.

May 25

Annual general meeting and luncheon of the British Granite and Whinstone Federation.

Annual general meeting of the Institution of Structural Engineers, 11 Upper Belgrave Street, London, S.W.1.

Visit of the Institute of Sewage Purification (Metropolitan and Southern Branch) to British Sugar Corporation, Peterborough, followed by a joint visit with members from the Midlands Branch to Peterborough Sewage Works.

May 29

Annual general meeting of the Hants. and Sussex branch of the Contractors' Mechanical Plant Engineers, Black Dog Inn, Emsworth, 7.30 p.m.

May 30

Unwin Memorial Lecture at the Institution of Civil Engineers, Great George Street, London, S.W.1. "The Work of the Institution's Research Committee," by Prof. J. F. Baker.

June 8

Meeting of the London branch of the Contractors' Mechanical Plant Engineers, Hendon Way Hotel, Hendon Way, N.W.4, 7.30 p.m.

CENSUS OF PRODUCTION ARRANGED FOR 1961

ARRANGEMENTS for the Census of Production to be taken in 1962 in respect of the year 1961 have now been settled after consultation with the Census of Production Advisory Committee. The Census for 1961 will be on similar lines to the census now being taken in respect of the year 1960, and will include firms engaged in mining and quarrying, manufacturing, construction and water supply.

Census returns will be required only from a sample of businesses employing 25 or more persons; they will not be required from those supplying the Board with monthly or quarterly figures of stocks and capital expenditure.

The questions asked will relate only to sales and work done, capital expenditure and stocks and work in progress. (Exceptionally, for the construction industry, information about employment will be required in place of sales and work done.) In addition to this information firms will be required to give details of their sales direct to the public (e.g., by mail order, to own employees, etc.). This

information will complement that obtained in the Census of Distribution for 1961 and will be used to improve the estimates of consumers' expenditure.

Future Programme

In accordance with a recommendation of the Verdon Smith Committee the periodicity of detailed Censuses of Production has been reviewed by the Board of Trade. They have concluded that census operations should be planned on the basis of a five-yearly interval between detailed Censuses of Production and between full and sample Censuses of Distribution. This programme will, however, be subject to further review in the light of changing circumstances and of Government needs.

As already announced, a detailed Census of Distribution is to be taken relating to the year 1961. It is intended that the next detailed Census of Production should relate to the year 1963, to be followed by a sample Census of Distribution for 1966 and by a detailed Census of Production for 1968.

PREFABRICATED SCHOOL BUILDING IN HAMPSHIRE

Hampshire county education committee propose to provide several primary schools in the 1960/61 and 1961/62 major building programmes in prefabricated systems of construction.

This will be to a design prepared, in consultation with the County Education Officer, by the County Architect or by private architects employed by the committee.

Although the authority have so far confined the provision of schools in prefabricated systems of construction to single-storey buildings, they have agreed to employ the "Derwent" and "Medway Mark V" systems of construction, in the provision of five junior schools included in the 1961/62 programme.

One or more junior schools will be built in each system of construction, provided the county architect finds it practicable to prepare a design or designs suitable for repetition on the various sites.

A report to the council says that financial economies in using a prefabricated system will not be the main object and none, in fact, may be achieved.

MAXIMUM NATURAL LIGHTING IN LEEDS PRINTING WORKS

CURTAIN walling supplemented by vertical fins at each mullion is a feature of a new three-storey printing works extension being built at Leeds for Alf Cooke, Ltd.

This feature makes the maximum use of natural lighting and eliminates direct sun glare. The fins will be of pressed metal construction, integral with the mullions at approximately 3ft. centres. They will run continuously from the top of the brick podium up to roof level, projecting about 12in. from the face of the building.

The new extension will be 120ft. long and will vary in width from 49ft. to 56ft., the storey heights being 18ft., 14ft. 3in. and 12ft. The lift machinery and heating plant will be housed in a brick penthouse on the flat roof.

The frame is of in-situ reinforced con-

crete construction with a main spine beam spanning 38ft. between twin internal columns, and the transverse beams having spans ranging from 21ft. to 28ft. This arrangement allows maximum unobstructed floor areas for the operation of the large printing machines.

Heating and ventilation will be by plenum system, allowing six complete air changes per hour. The heater batteries, filters, fans, etc., are all housed in the roof penthouse, distribution of air being by means of a main vertical duct immediately beneath, and thence in ducts housed in the main and transverse beams.

The building, costing about £80,000, is scheduled for completion before the end of the year. Holland & Hannen and Cubitts (Scotland), Ltd., North East Area Office, Gateshead, 11, are the main contractors. Plans are by J. H. Napper and Partners, Newcastle upon Tyne.

NEW GLASGOW STORE FOR WOOLWORTHS

JOHAN LAING CONSTRUCTION, LTD., have started work on the construction of a new store for F. W. Woolworth and Co., Ltd., at the junction of Argyle Street and Miller Street, Glasgow. The new building, due for completion by March, 1962, will replace the original store which was destroyed by fire in October last year.

The building will have lower ground and ground level sales floors aggregating a total area of nearly 40,000 sq. ft. On the first floor there is to be a large cafeteria with modern kitchen, and also extensive staff rooms. The second and third floors will accommodate stock rooms, including facilities for refrigeration and meat preparation. Four goods lifts will operate in conjunction with a ground floor loading bay. At the rear of the building there is to be a car park for 24 vehicles.

The new store is to be of steel-framed construction with precast concrete floors and natural Portland stone facing. Argyle and Miller Street elevations will also include the use of black, red, and grey granite and mosaic infilling panels between windows.

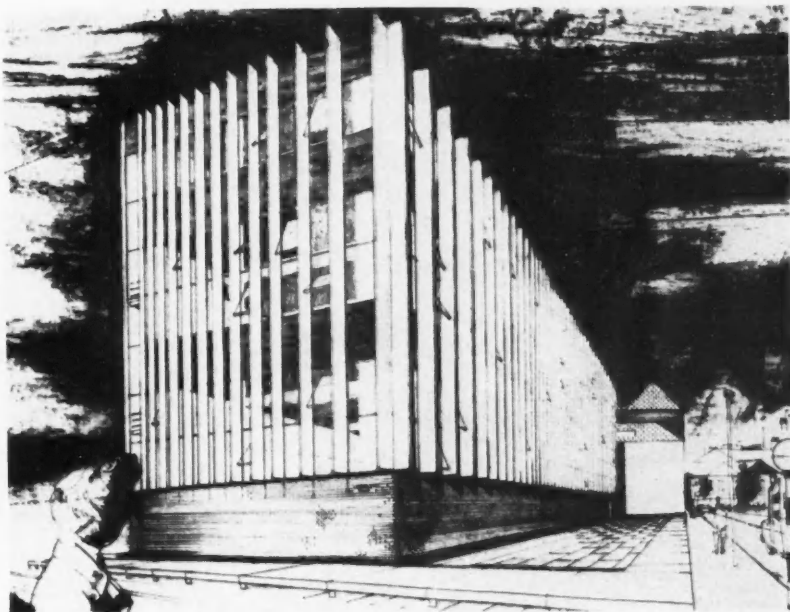
The architect for the project is G. Gilford, L.R.I.B.A., district architect, F. W. Woolworth and Co., Ltd.

MOTORING ORGANISATIONS CALL FOR CUT IN TAXATION

Britain's three motoring organisations, the R.A.C., the A.A. and the R.S.A.C., in a statement issued last week, said that the country's motoring community was being "squeezed dry" by the high rate of motor taxation.

The Standing Joint Committee of the R.A.C., the A.A. and the R.S.A.C. has appealed to the Chancellor of the Exchequer for a cut in taxation in next month's budget, pointing out that the annual yield of over £600 million a year is out of all reasonable proportion to Government expenditure on roads.

A spokesman for the Standing Joint Committee said: "The total amount received by the Government from motor taxation has steadily increased over the years with the rapid growth in the number of vehicles in the country. During the past 10 years less has been ploughed back by the Government into the roads programme than was taken in taxation during last year alone. The burden shouldered by the motoring public could be lightened considerably by a review of the fuel tax, which stands at 2s. 6d. a gallon. A reduction is long overdue, bearing in mind that the cost of petrol to road users is more than doubled by taxation".



Artist's impression of the works extension

ANOTHER BRITISH TUNNELLING RECORD

A NEW British tunnelling record has been achieved by Thyssen Shaft Sinking Co., Ltd., at the Blaengwrach New Drift of the National Coal Board (South Western Division).

In a seven day period between 7 a.m. on February 20, and 7 a.m. on February 27, a 14ft heading rising at 1 in 300 was advanced 108yd. through shales, sandy shale, and at times thin coal seams. The previous record was held by a team of National Coal Board tunnellers at Bank Hall Colliery, Lancashire, with an advance of 107yd.

The advance of 108yd. also ended a four week period in which the drift was advanced 264yd. in 24 working days at an average of 11yd. per day.

General Statistics

The ground excavated totalled 1946 cu. yd. including 50 cu. yd. of overbreak which occurred in the proximity of coal seams.

The labour force per shift consisted of the following: Underground—6 Face

Workers, 1 Loco Driver, 1 Assistant Loco Driver and 1 Fitter; Surface—1 Lorry Driver and 2 Labourers.

The efficiency of the face workers was 15.44 cu. yd. per manshift, with 7.72 cu. yd. per manshift for all employed.

During the seven days, 44 cycles were completed in an average of 3 hours 49 minutes per cycle, the best achievement being one complete cycle in 2 hours 28 minutes.

Joy-Sullivan A.I. 47 drilling machines drilled an average of 34.8ft. holes per round, a round of holes used 83.5lbs. of explosives and gave an average advance of 7.37ft. For drilling a round of 34 holes the best time was 25 minutes compared with an average of 43 minutes.

The loading of 1,628 trams of muck at 37 trams per round was done by two Atlas Copco L.M. 100 loaders working in tandem in an average of 65 minutes per round with a best effort of 45 minutes for the operation. The muck was loaded into 55 cu. ft. Tredomen mine cars, and haulage was by two diesel locomotives.

LACK OF COMPETITION IN TENDERING

A serious lack of competition in tendering for new schemes, resulting in considerably increased tenders, is reported by Hampshire county education committee.

"This situation has arisen because, at the present time, the building industry is considerably overloaded," the committee declares.

Although similar problems are being experienced by other authorities, they are very marked in Hampshire where rapid building development is taking place.

For the two major building programmes 1960/61 and 1961/62, the council has authorised a total expenditure of £3,213,000.

The VIth Congress of the International Union of Architects, to be held in London from July 3-7, will be opened by Her Royal Highness The Princess Margaret.

International Construction

MODERNISATION OF TRINIDAD'S GENERAL HOSPITAL

Three New Multi-Storey Blocks

AT the General Hospital in Port of Spain, Trinidad, work is progressing on a modernisation programme which, when completed, will make the hospital one of the largest, most modern and best equipped in the whole of the Caribbean area.

New buildings, being built by Holland & Hannen and Cubitts (Trinidad), Ltd., comprise three blocks, with accommodation for approximately 700 beds, and are constructed of reinforced concrete to eaves roofed with steel with wide overhanging eaves to provide as full a protection as possible to all floors from sun penetration.

The main six-storey wards and general treatment block, sited in the central garden courtyard, is built on stilts to allow the free circulation of air to the existing building.

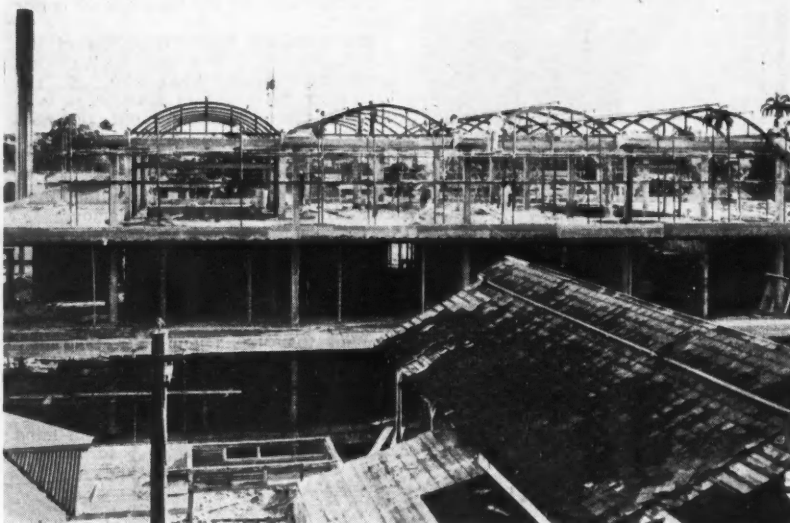
The operating theatre block, which is contained on two floors and is roofed with curved structural steel roof members, is connected to the main block by means of

a bridge of lattice steel construction with side glazing which is ramped to permit the smooth passage of stretcher trolleys between the main block and the theatre.

The third block comprises a three-storey maternity wing which again is provided with a fully overhanging structural steel pitched roof. All three buildings are sited in landscaped garden and pedestrian areas.

Some 160 tons of structural steelwork was supplied and erected by Sanders and Forster, Ltd., of the Chamberlain group of companies, London, using local labour recruited by supervisors sent out from this country. To speed the erection, arrangements were made for Sanders and Forster to use the general contractors' tower crane.

The new buildings have been designed by the London architects, Devereux and Davies and directed through their Port of Spain offices, whilst the consulting engineers for the contract were Clarke, Nicholls and Marcell of London, again operating through their local Port of Spain office.



Construction work in progress

MIDDLE EAST ASSOCIATION'S FIRST MEETING

THE Executive Committee of the newly incorporated Middle East Association has held its first formal meeting. The Association, which is non-political, has been set up to promote mutual trade relationships between Great Britain and the peoples of the Middle East.

About 50 companies from banking, industry and commerce have so far joined and it is hoped the membership will be enlarged to include all companies with interests in the countries covered by its activities, namely Aden, Bahrain, Ethiopia, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Sultanate of Muscat and Oman, Qatar, Saudi Arabia, Sudan, The Trucial States, Turkey, United Arab Republic and Yemen.

The Committee elected Sir Neville Gass as chairman, and Mr. R. M. Wynne-Edwards (a managing director of Constructors John Brown) as vice-chairman. Other members of the Committee are Mr. J. Allcard of Gray, Mackenzie and Co., Mr. A. E. Durling of the Dunlop Rubber Co., Mr. F. W. Edwards of Guest, Keen and Nettlefolds, Mr. H. S. Feetham of Shell International Petroleum, Mr. M. Kewley of Unilever, and Mr. L. H. Short of English Electric. Sir Ferguson Crawford has been appointed Director General, and Mr. R. H. Arnold is Secretary and Treasurer.

The Association is at present negotiating for premises in the West End of London and in the meantime inquiries should be addressed to The Secretary, The Middle East Association, River Plate House, Finsbury Circus, London, E.C.2.

BRITISH CHEMICAL PLANTS FOR RUSSIA

Two contracts, worth more than £2m., for the design, supply and commissioning of two major chemical plants in the U.S.S.R. have been placed by Techmashimport of Moscow with Wycon Services, Ltd., a company formed by Fisons, Ltd., and Constructors John Brown, Ltd., for the purpose of exporting chemical plants.

One plant is for the production of dimethylol ethyleneurea and will produce 12,000 tons per annum. This contract is valued at more than £750,000. The other contract is for a plant to produce MCPA, a hormone weedkiller substance, and this will cost more than £1½m.

The work will be executed by Constructors John Brown, Ltd., Whiffen and Sons, Ltd. (the industrial chemical subsidiary of Fisons) and Fisons Pest Control, Ltd.

OTIS LIFTS FOR LAGOS BUILDING

The Otis Elevator Co., Ltd., Falmouth Road, London, S.E.1, have been awarded a large contract to instal lifts in the new Independence Building at Lagos, Nigeria. Plastic coated steel sheet, made by John Summers and Co., Ltd., Shotton, Chester, is to be used for the lift cars.

250 DIESEL ENGINES FOR AUSTRALIAN TRACTORS

Henry Meadows, Ltd., Wolverhampton, report a further repeat order from Australia to supply 250 Meadows type 330 diesel engines for the Australian built Chamberlain Countryman Tractor.

GUINNESS BREWERY IN NIGERIA

Arthur Guinness, Son and Co., Ltd., plan the erection of a brewery in Nigeria on a 14-acre site at Ikeja, near Lagos. Designs are now being prepared and it is hoped that the brewery will be completed by October, 1962. The capacity will be 100,000 barrels a day.

TENDER ACCEPTED FOR NIGER BRIDGE

The tender of Dumez (Nigeria), Ltd., has been accepted by the Federal Government of Nigeria for the erection of a bridge across the River Niger at Onitsha.

Due for completion in four years, the bridge will have a steel superstructure consisting of eight 427ft. spans over the river, with shorter shore spans on each side. It will provide a through run from western to eastern Nigeria.

DURAPIPE SOUTH AFRICAN AGREEMENT

Durapipe and Fittings, Ltd., West Drayton, Middx., have completed arrangements for the production of their thermoplastic piping in South Africa. It will be manufactured by Pretoria Industrial Plastics, Ltd., a subsidiary of Anglo-Transvaal Mining Group, and the sole selling agency will be put in the hands of H. Incedon (S. Africa), Ltd.

ORDER FROM POLAND

An order for a 40-ton shipyard tower crane, worth £100,000, has been received from Poland by Butters Bros. and Co., Ltd., Glasgow, S.1.

SHOVELS FOR COFFEE

Bray Construction Equipment, Ltd., of Feltham, Middx., are supplying Columbia with 10 loading shovels to a total value of £20,000. Payment will be made in coffee

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Greater density
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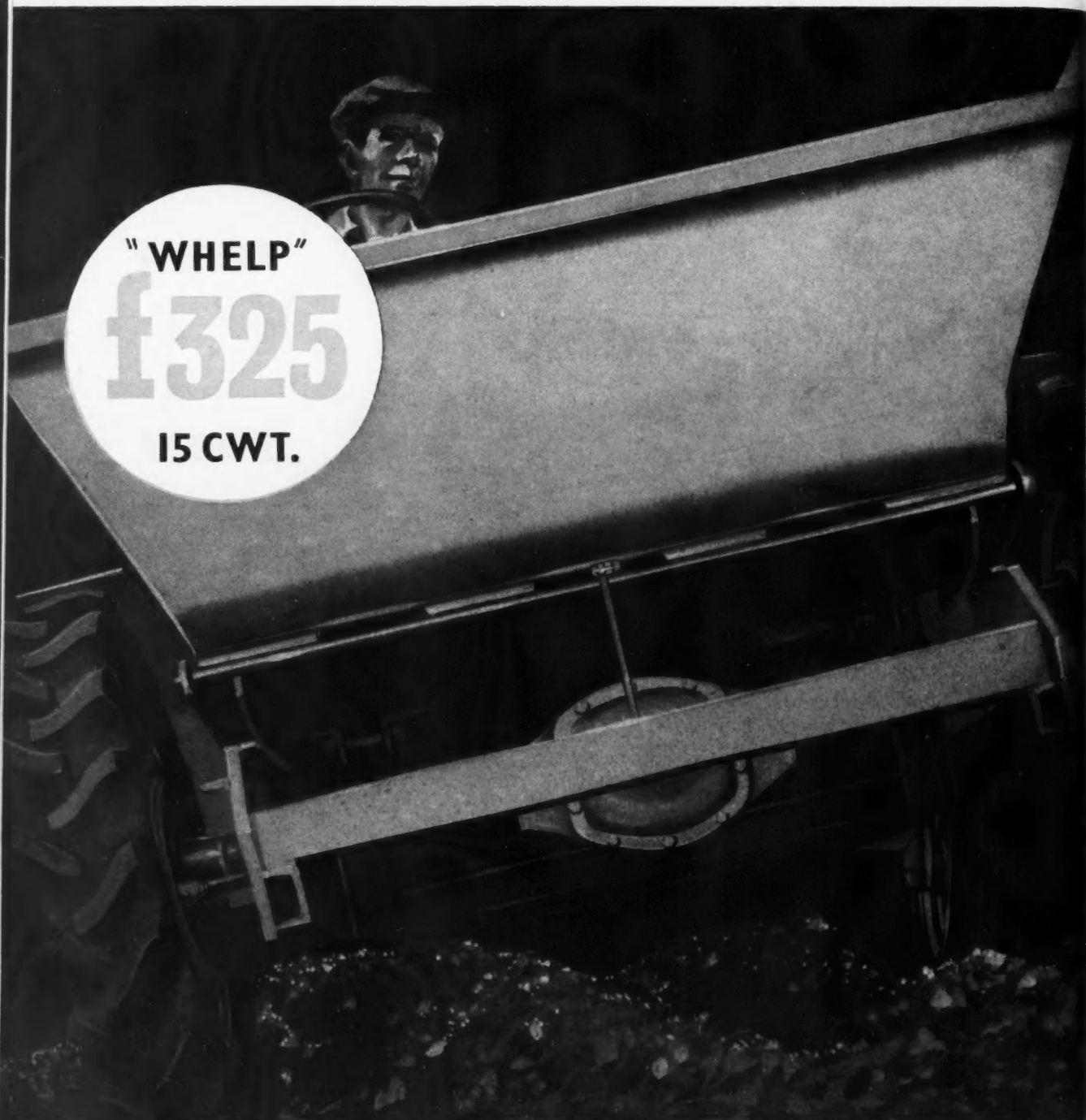


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"WHELP"
£325
15 CWT.

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ips are really designed—designed for strength and use. RoadMac improved dumpers give high weight capacities.

5 cwt. Whelp - 18 cu. ft. struck
1 cwt. Cub - 22 cu. ft. struck
10 cwt. Lioness - 28 cu. ft. struck

THEY'RE EASY TO LOAD

Low loading height for ease of charging under mixer or by hand. There is no spillage loading the improved RoadMac dumpers.

15 cwt. Whelp 3'1"
22½ cwt. Cub 3'6"
30 cwt. Lioness 3'6"

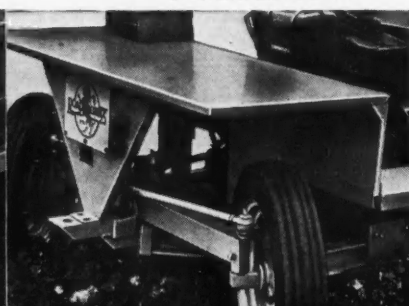
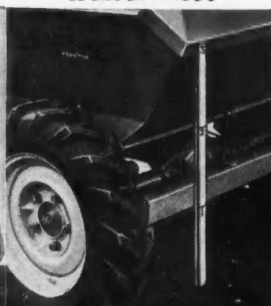
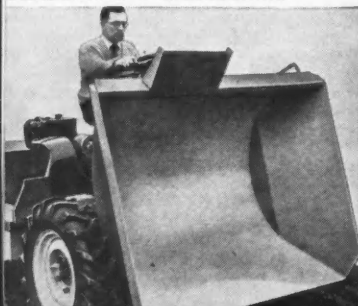
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Save precious time charging, travelling, dumping on busy road and congested site. RoadMac improved dumpers are more manoeuvrable

Turning Radius: } 15 cwt. Whelp 7'9"
22½ cwt. Cub 7'9"
30 cwt. Lioness 10'0"

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The RoadMac improved range is the result of long experience in the design and manufacture of dumpers. They take the hardest going in their stride. Contractors throughout the world depend on RoadMac dumpers.



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"Cub"
£425
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"LIONESS"
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West Drayton, Middlesex

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* TICK OFF REQUIREMENTS

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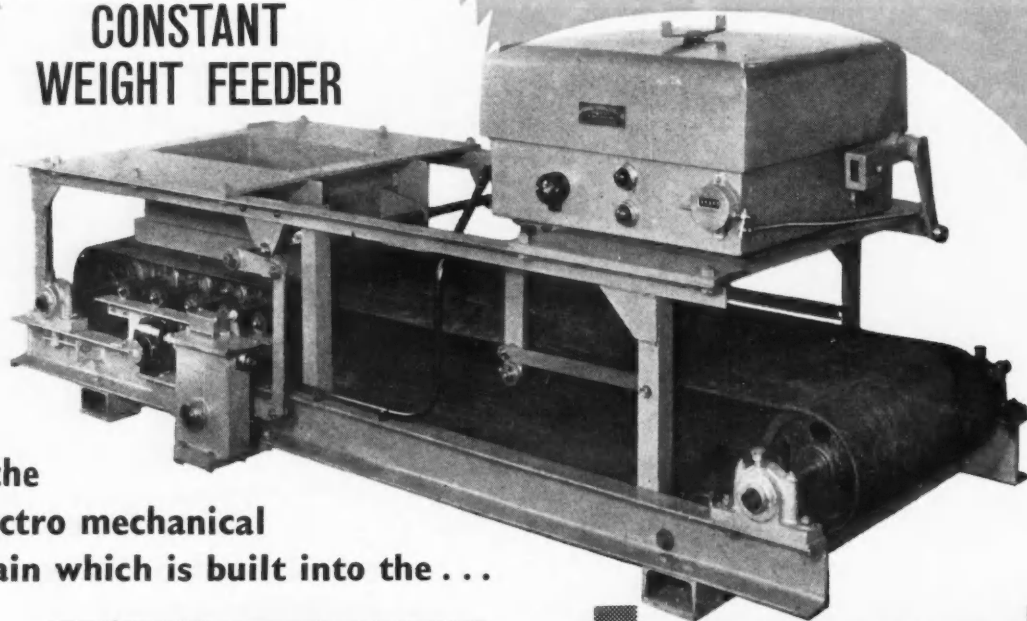


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(Continued from page 1516)

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CRANES:
JONES KL15 15cwt. MOBILE. Diesel, pneumatics, 1957, good working order, £650.
TAYLOR 2-ton JUMBO JUNIOR. Diesel, pneumatics, good working order, £950.
DARLINGTON 2½-ton HI-MOBILE. 1957, petrol, pneumatics, good condition, £875.
JONES KL22 2-MOBILE. 24ft. Jib, on pneumatics, registered 1954, £875.
JONES KL44 MOBILE. 1951, 24ft. Jib, good condition, £1,850.
SMITH 5-ton DIESEL MOBILE. 50ft. Jib, solids, £1,500.
BUTTERS 5-ton ELECTRIC DERRICK. 75ft. Jib, good condition, £650.
ANDERSON-GRICE 5-ton STEAM DERRICK. 110ft. Jib, good order, £1,000.
JONES KL66 6-ton DIESEL MOBILE. 30ft. Lattice Jib, pneumatics, 1952, first-class order, £4,575.
BOOTH 7½-ton OIL-FIRED STEAM SHUNTING LOCO. 30ft. Jib, 1949. Price on application.
LORAIN MC3 7½-ton LORRY-MOUNTED. 60ft. Jib, Cummins Diesel, pneumatics, £4,950.
BUTTERS 7-ton ELECTRIC DERRICK. 120ft. Jib, Bogies and Bowsail, 1951, £4,400.
COLES 10-TON CRAWLER CRANE. Two jibs included, lifts 5½ tons at 20ft. radius, very good condition, £2,950.
BROWNING 12½-ton LORRY-MOUNTED. 60ft. Jib, 6LW Gardner, pneumatics, good working order, £5,500.
MORGAN 10-ton Single-motor ELECTRIC DERRICK. 120ft. Jib, Bogies and Bowsail, £4,950.
COLES 12½-ton MOBILE. 60ft. Jib, on pneumatics, November, 1958, £6,500.
BUTTERS 10-ton OIL-FIRED STEAM DERRICK. 120ft. Jib, good working order, £3,850.
RUSTON 22RB 15-ton TRANSIT CRANE. Foden Chassis. 80ft. Jib, 1956, very good condition, £8,750.
MORGAN 15-ton STEAM DERRICK. 120ft. Jib, new 1958, on Bogies. Price on application.
COLES 20-ton LORRY-MOUNTED. 80ft. Jib, new 1954, on pneumatics, very good order. Price on application.
COLES 40-ton LORRY-MOUNTED. new 1954, in very good condition. Price on application.
PINGON P20 and P40 CLIMBING and P60 TRAVELLING TOWER CRANES, new 1958. Attractive prices.
RECORD 607 TOWER CRANE. 3-ton, 92ft. Jib, new 1960, £7,500.
BUILDMASTER SK25N CLIMBING. 1960.
JULES WEITZ G15-20 TOWER CRANE. 1953.
FOR A COMPREHENSIVE LIST OF PLANT FOR SALE HIRE—SEND FOR VALES FREE PLANT REGISTER. Further details: 14 Lower Grosvenor Place, London, S.W.1. Victoria 7531, 3501, 8080, 9886 (15 lines).
URGENTLY WANTED. 19RBs, 22RBs, 33RBs and N.C.K. 304 EXCAVATORS, fitted with Dragline or Face Shovel Equipments. Machines must be in good condition. Immediate inspection and settlement. Write GRAYSTON PLANT AND ENGINEERING CO., LTD., 32 Stewarts Road, S.W.8. Macaulay 6688.

FOR SALE

1960 J.C.B. 4, two months old, with three buckets, £2,500.
ALLIS-CHALMERS:
1944 Allis-Chalmers HD7, fitted with Hydraulic Angledozer and P.C.U., £500.
1949/55 Allis-Chalmers HD5G Tractor Shovels. Choice of five, £1,300.
1954 Allis-Chalmers HD5G Tractor Shovel, overhauled track group, £2,750.
1960 Allis-Chalmers HD5G Tractor Shovel, with Hydraulic Ripper. Ex demonstration machine, £6,000.
1960 Allis-Chalmers BTL 14D 1½ cu. yd. Wheeled Tractor Shovel. Ex demonstration model, £5,200.
FIAT:
1951 Fiat 55L, fitted with Hydraulic Angledozer, £850.
1952 Fiat 55L, fitted with Hydraulic Angledozer, reconditioned engine, £950.
1954 Fiat 55, fitted with Hydraulic Angledozer, £950.
1954 Fiat 55L, fitted with Hydraulic Angledozer, £1,100.
1960 Fiat FL4 3½ cu. yd. Tractor Shovel, with Hydraulic Ripper. Ex demonstration machine (two), £2,300 and £2,400.

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Carco E Timber Winches, overhauled, £350.

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1959 Bedford 1½-bag Petrol-driven CONCRETE MIXER, two rubber-tyred wheels, £40.
Two 3yd. Muir-Hill 108 Reverse-seat type DUMPERS, Perkins P6 Engines, £195 each.
10RB Diesel EXCAVATOR, Ruston Diesel Engine, 16400 Series, Skimmer and Backacter, sound order, £1,200.
22RB Diesel-driven EXCAVATOR, Ruston Diesel Engine, Dragline Equipment, 15600 Series machine, £3,250.
20ST Record Self-erecting TOWER CRANE, pneumatic-tyred wheels, overrun brakes, 34ft. radius, 66ft. maximum lift, £1,500.
1955 Whitlock DINKUM DIGGER, Ford Major Tractor complete with Cab, lighting equipment, 18in. and 24in. Bucket, Sky-hi Front Shovel. The whole first-class order throughout, £700.
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21/17 Priestman Single Chain Ring Discharge GRAB, complete with teeth, £165.
1958 Ford County 4-wheel TRACTOR, complete with Bray Hydraulic Angledozer Equipment, towing hitch, etc. Ford 4D Diesel Engine, 400 x 24 tyres, excellent order, £925.
Late 1956 Bray Diesel-driven LOADING SHOVEL, Ford Diesel Engine, power steering, crane attachment, sound order throughout, £575.
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FOR SALE, LOW-LOADING TRAILERS, from 3 tons to 12 tons: Lister-Air Pumps COMPRESSORS, equal to new, from £425; TANKERS, from 100 galls. to 950 galls.; GENERATING SETS, from 1½-kVA upwards, Diesel and Petrol driven; large stocks of ex M.O.S. Equipment. Send for lists.—S. T. BELTON (TRACTORS), LTD., Tower Road, Boston, Lincs. (Phone 2590/2690).

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Caterpillar HT4 TRAXCAVATOR, 1 1/2 cu. yd. Bucket.
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Lima 802 EXCAVATOR, Serial No. 5094, powered by Caterpillar Diesel Engine. This machine is fully rigged as a Crane, with a 115ft. jib, Back Hitch Gantry, Pendant Boom Suspension and Safe Load Indicator. Ex Yorkshire depot, £9,250.
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Fuller details on application. Write:
GRAYSTON PLANT AND ENGINEERING CO., LTD.,
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Atlas-Copco MOBILE COMPRESSOR, on Ford Thames Lorry, in good condition. Price £425 or offer.
Atlas AIR DRILLS, Type RAB12E, Drill Cap 1 1/4in., 225 r.p.m. Price £27.
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Benford Model RAY Hydraulic One-bag MIXER, with Detachable Loader, 1958 model, good condition. Price £235.

PLANT HIRE SERVICE (LONDON), LTD.

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FOR SALE. J.C.B. HYDRA-DIGGA LOADALL, 1959, £1,650.—T. BOYD, 49 Diamond Road, Watford, Herts.

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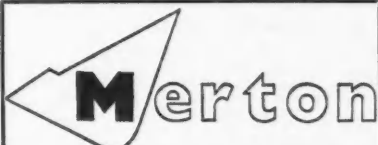
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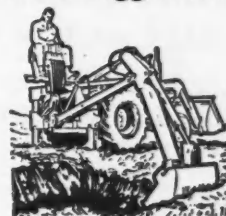
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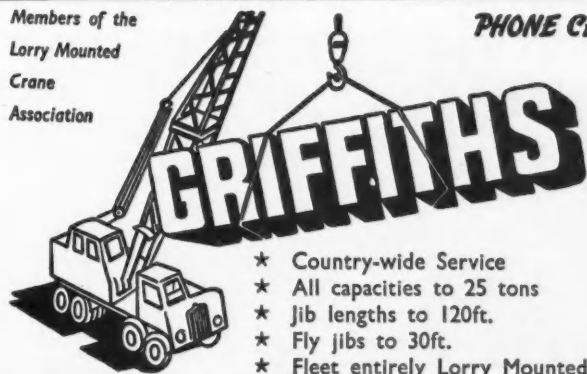


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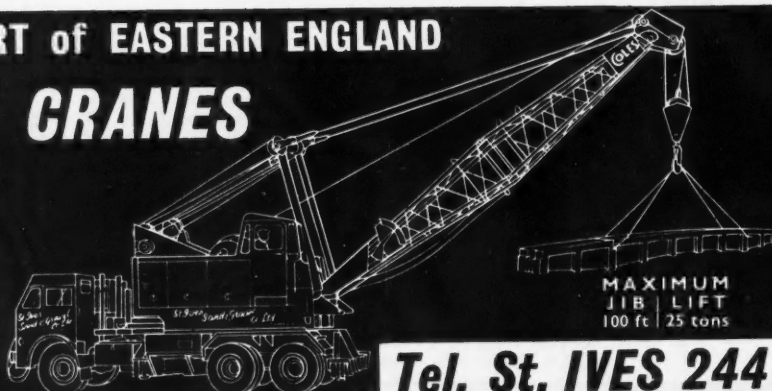
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Ruston 17RB, 4VRON Engine (electric start), Crowd
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10RB BACKACTER.
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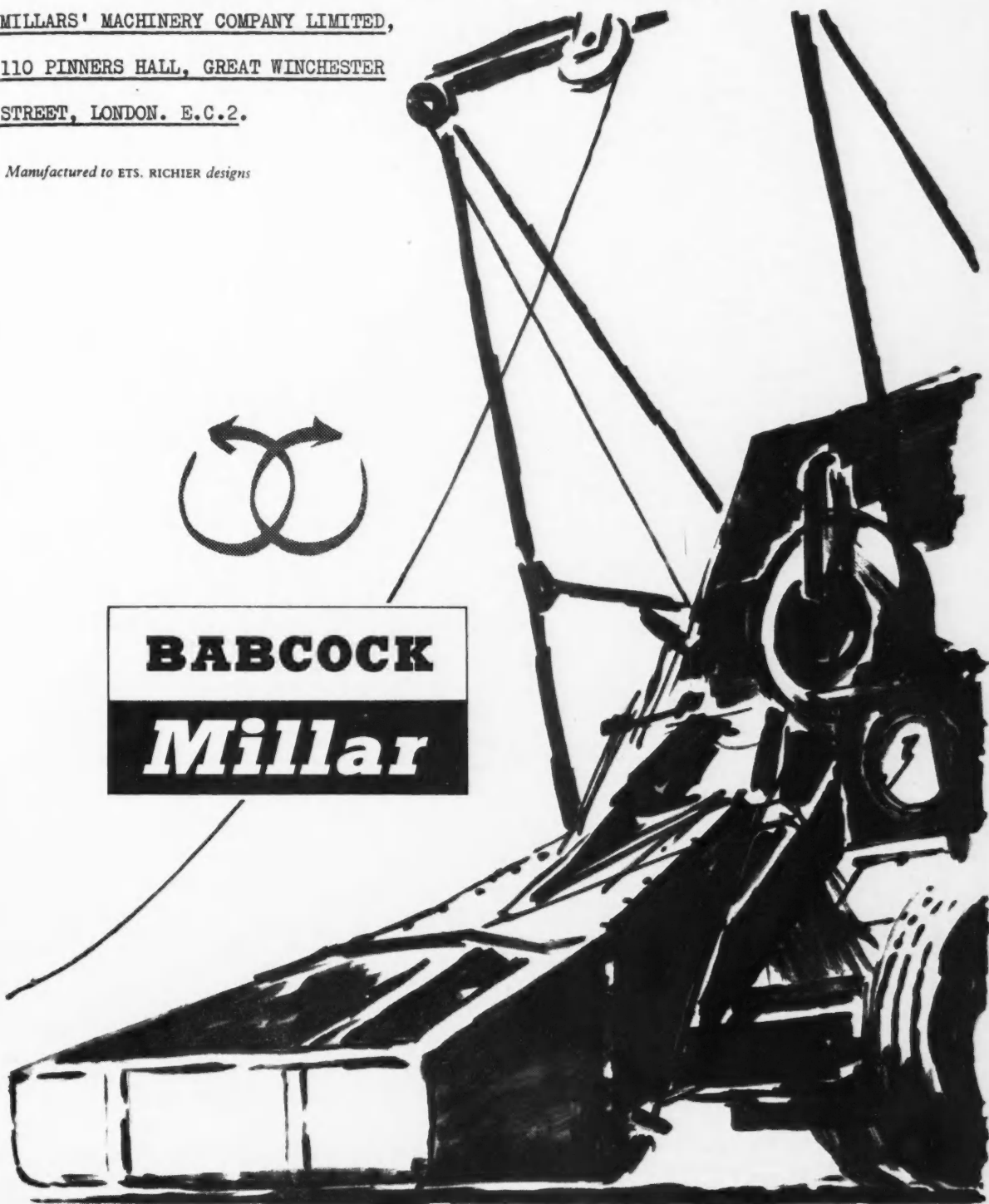
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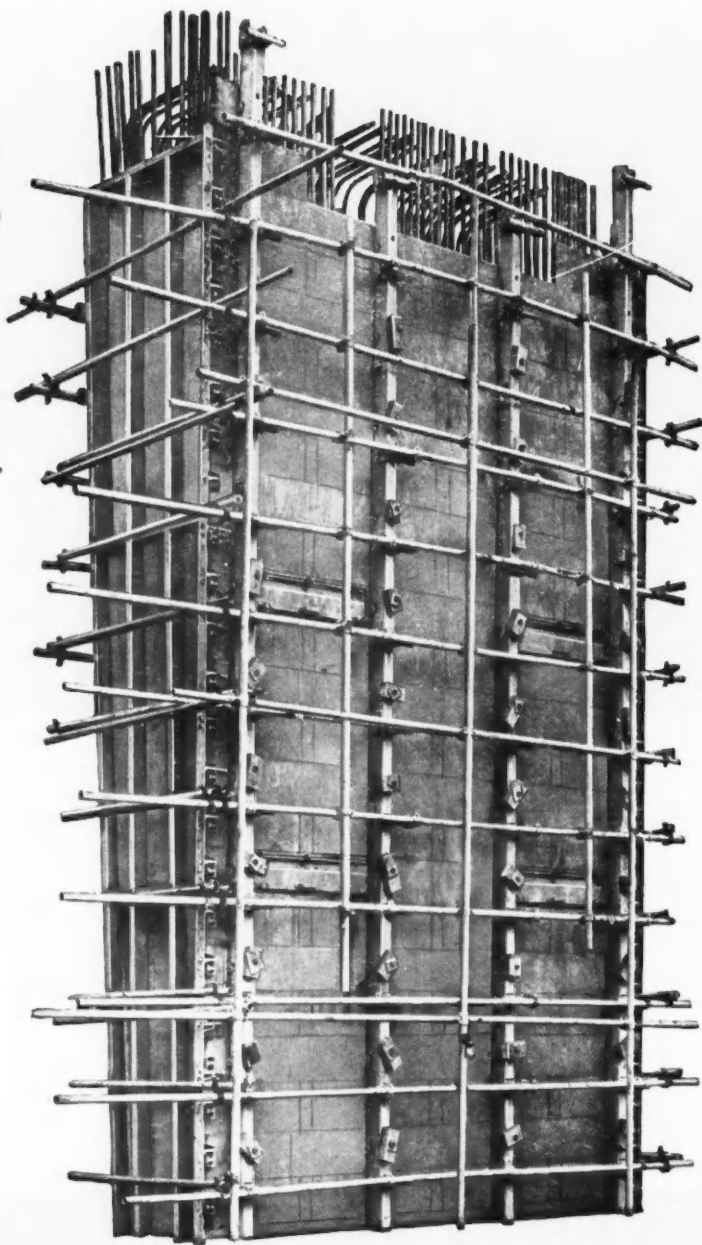
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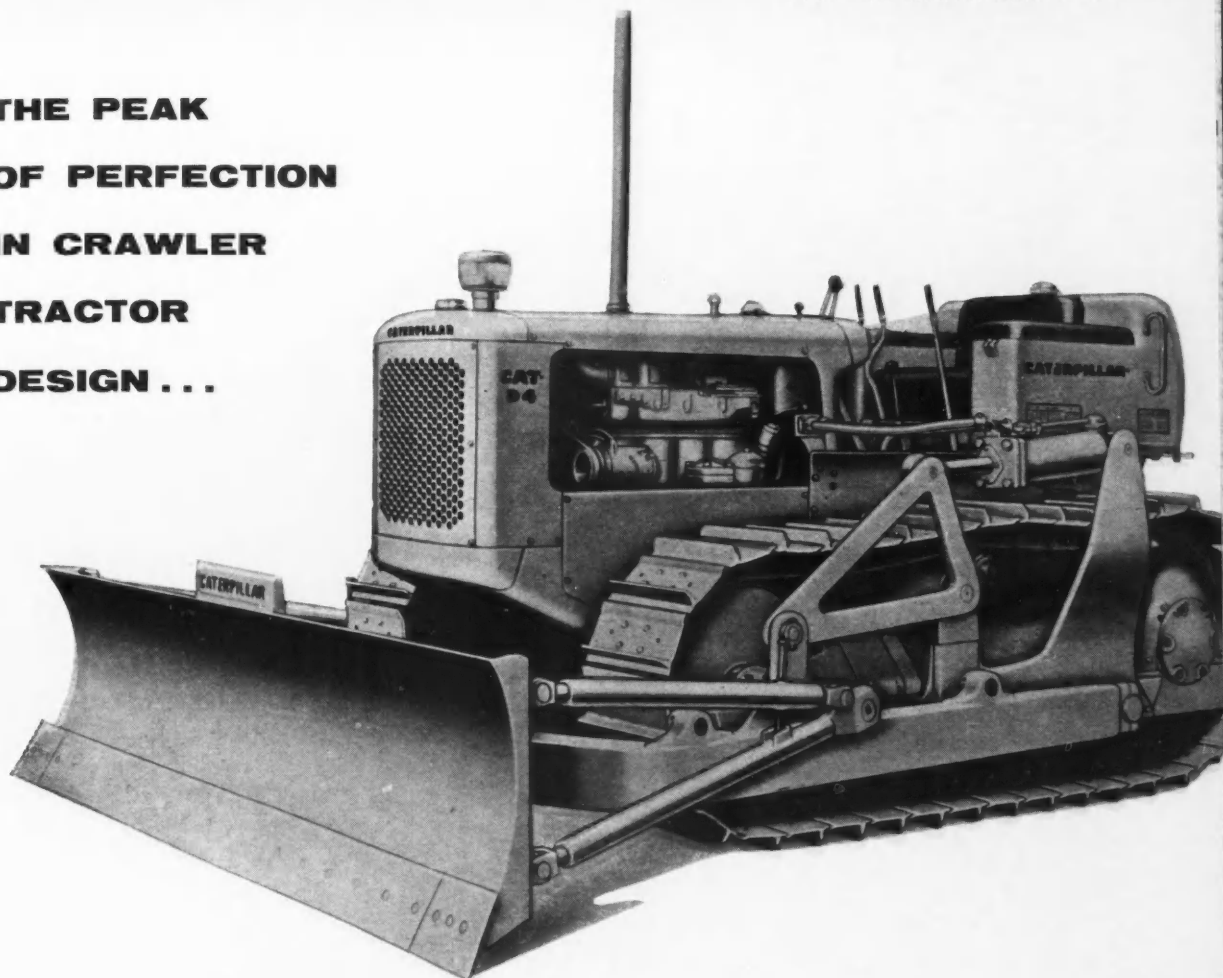
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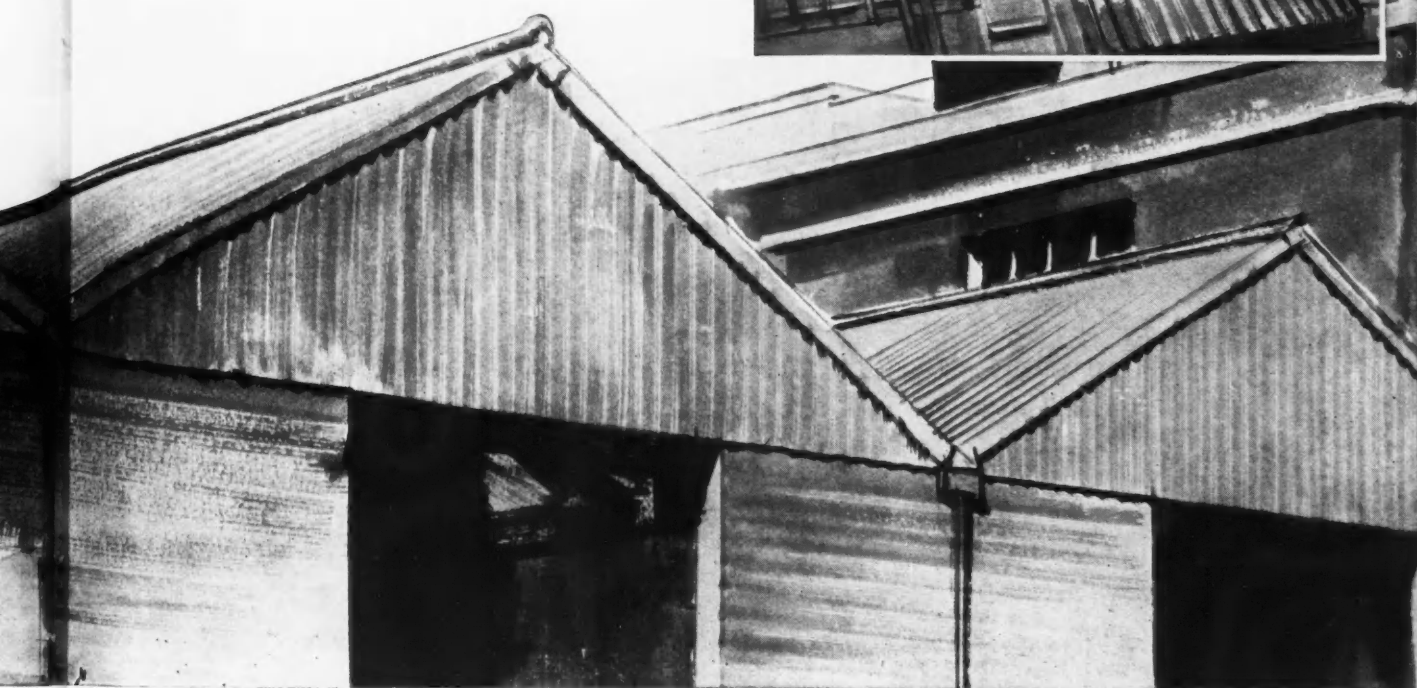
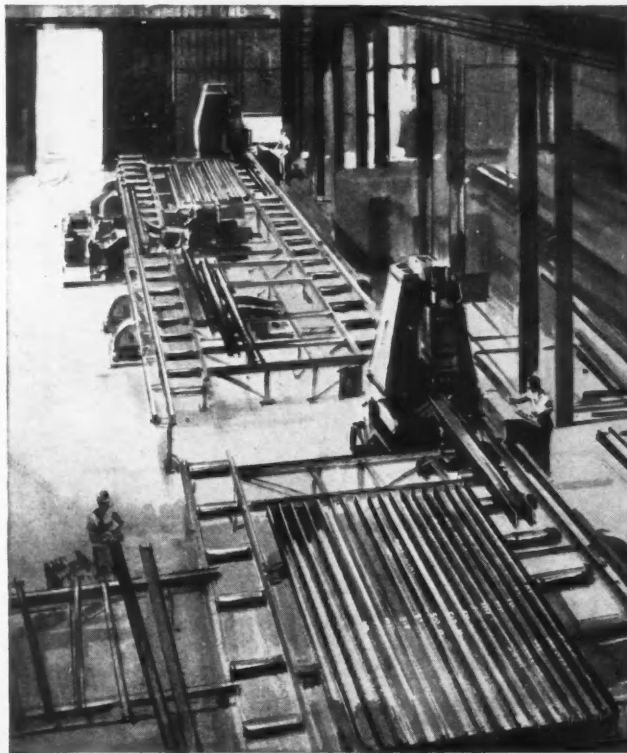
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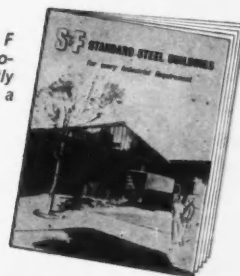
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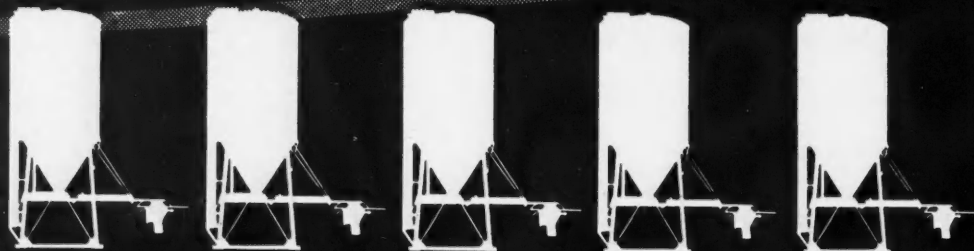


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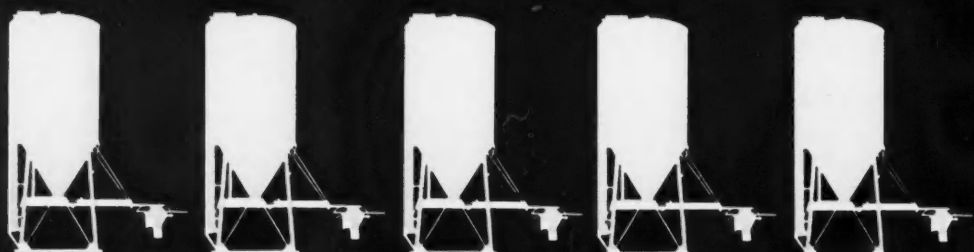
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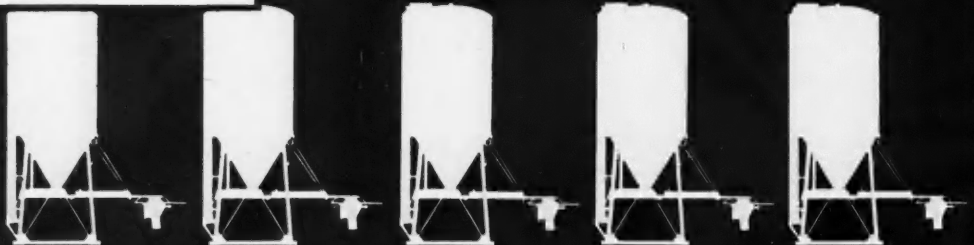


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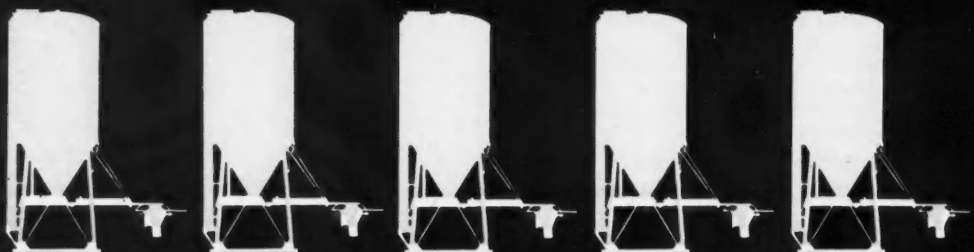
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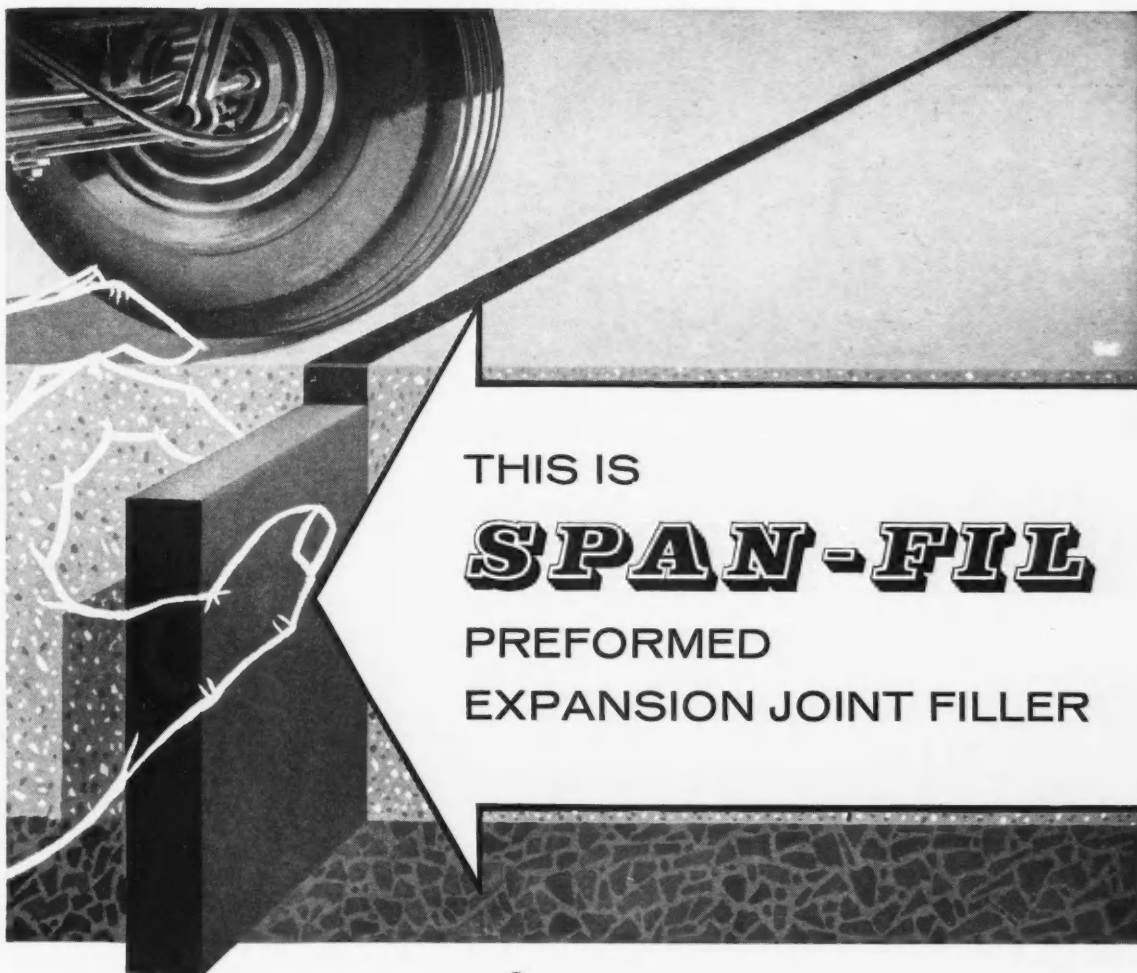
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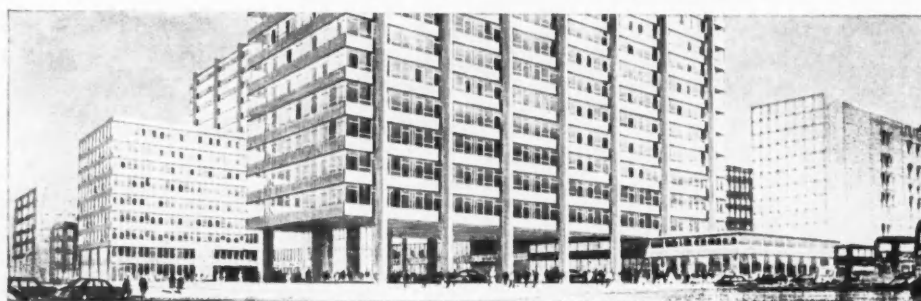
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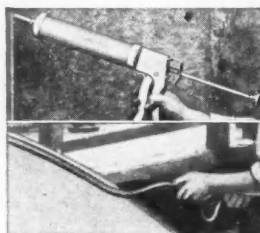
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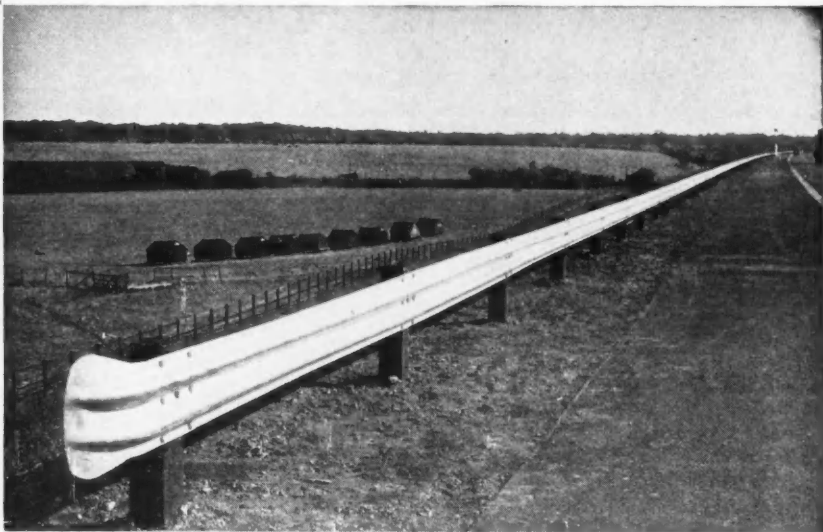
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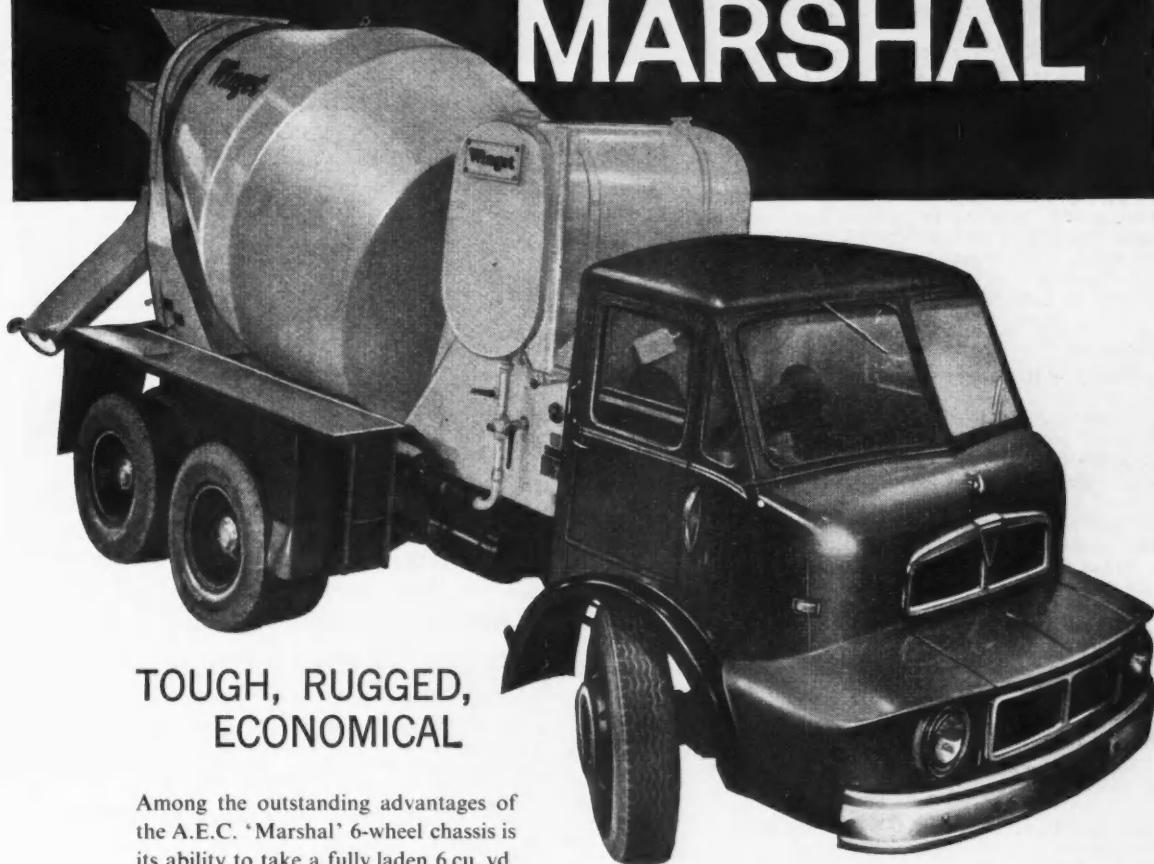
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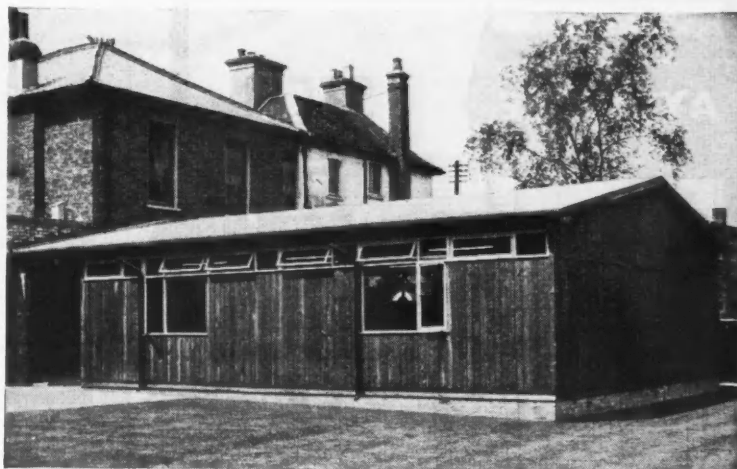
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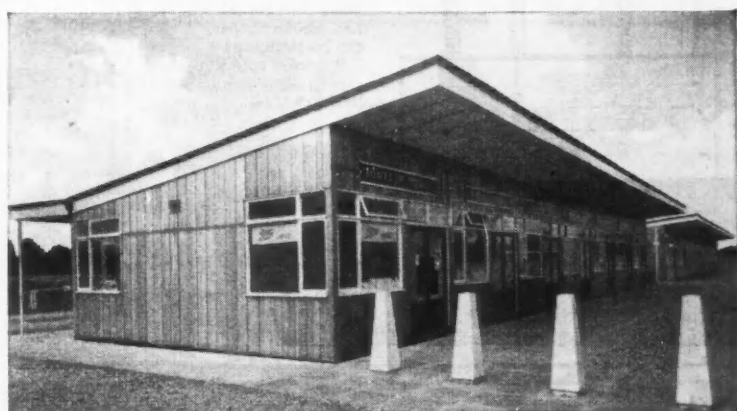
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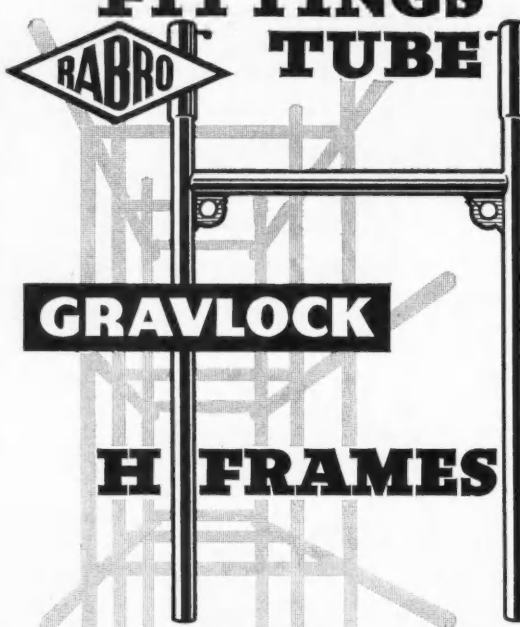
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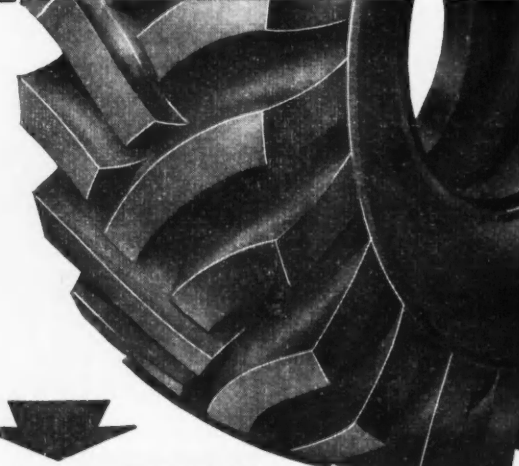
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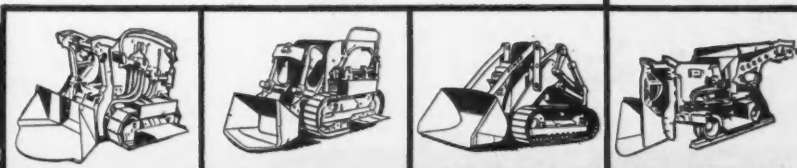
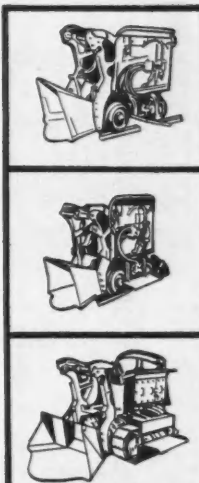
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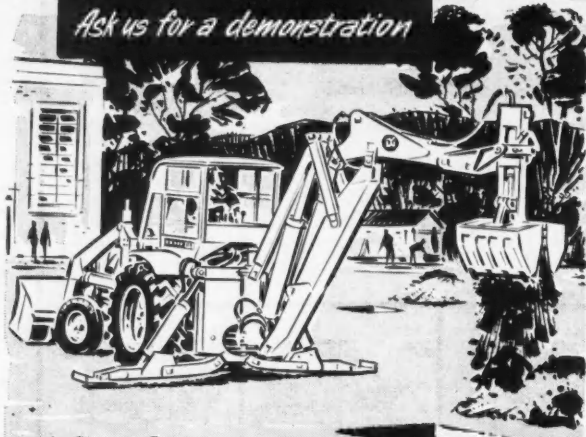


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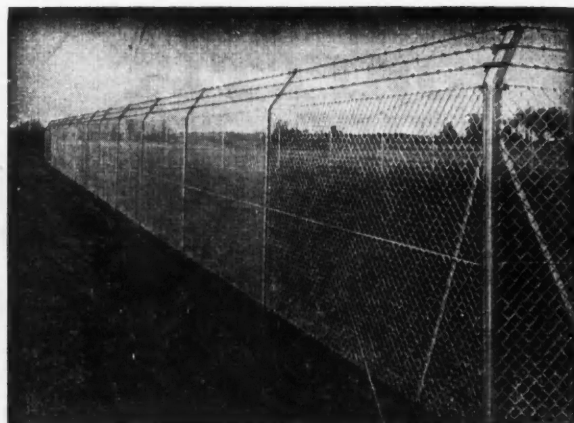
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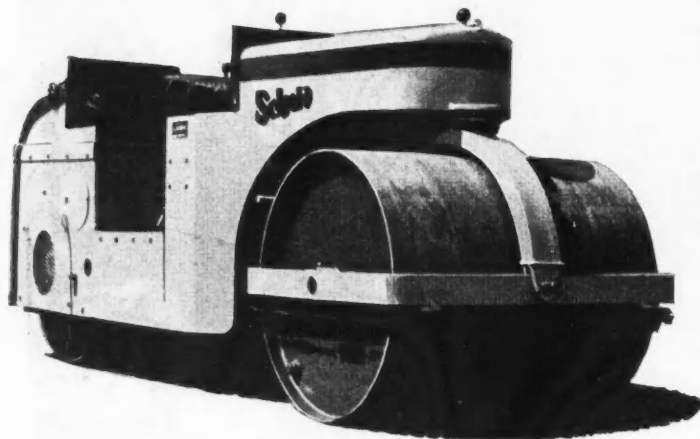
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Total height	3'4"	5'1"
Total length	9'8"	12'6"
Total width	3'8"	4'7"

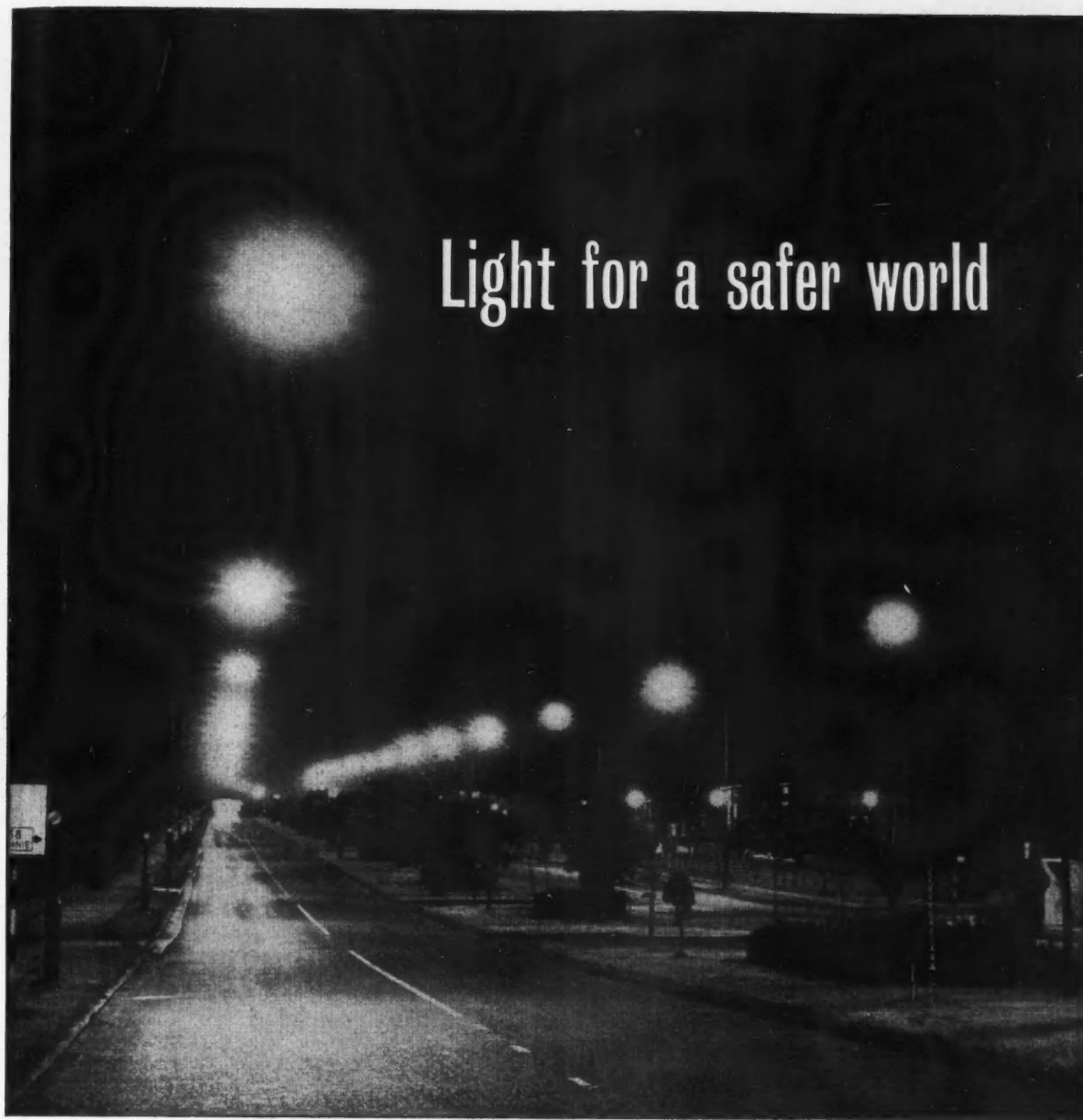
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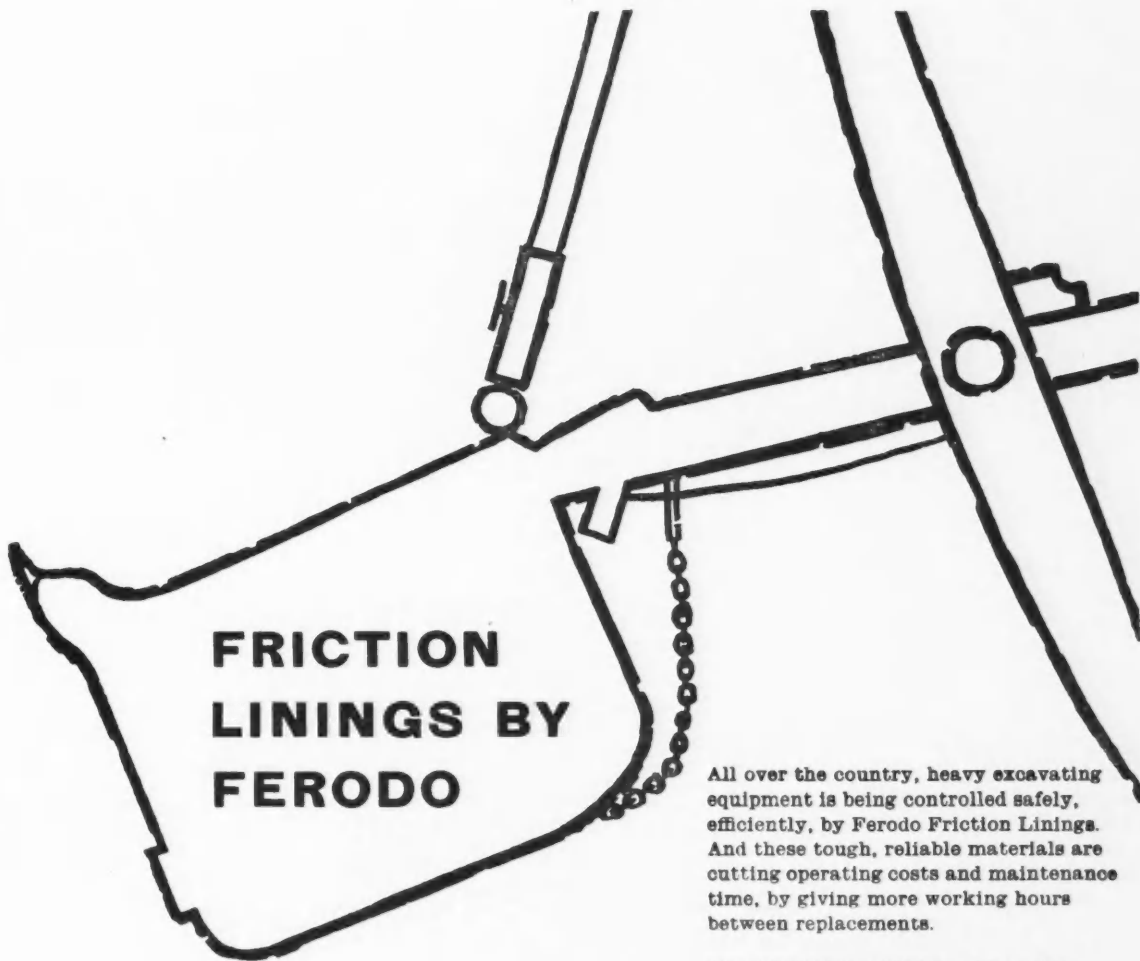
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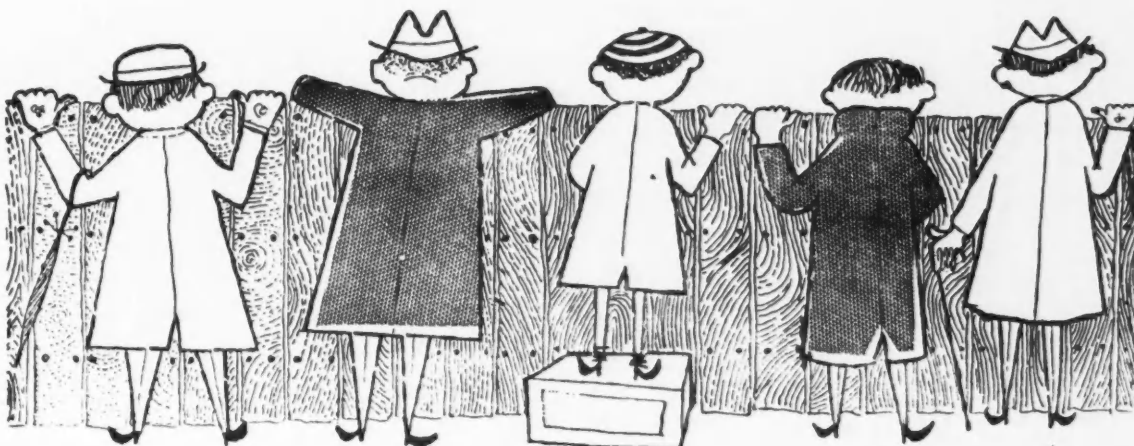


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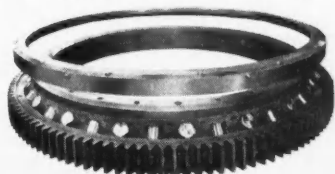
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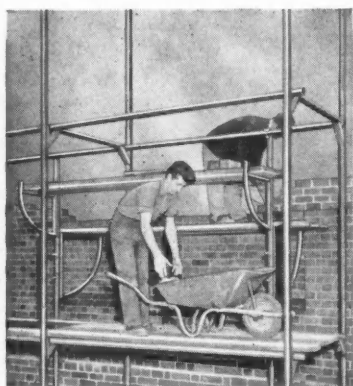
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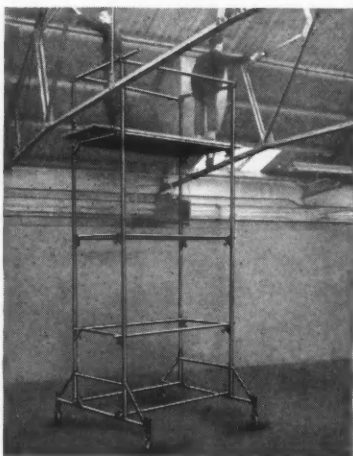
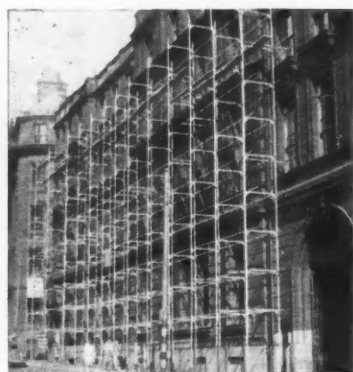
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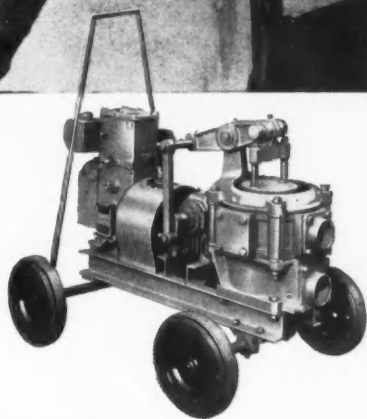
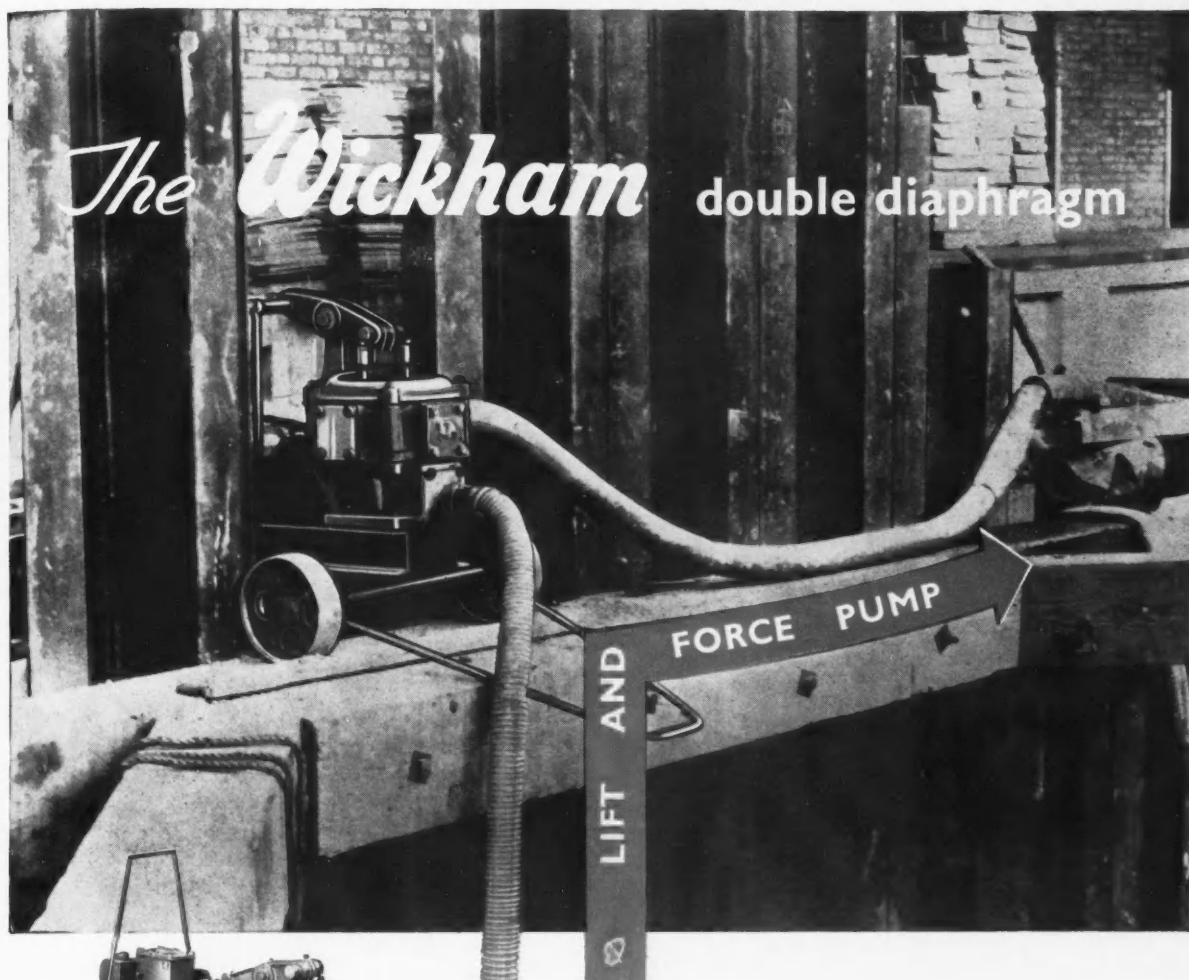
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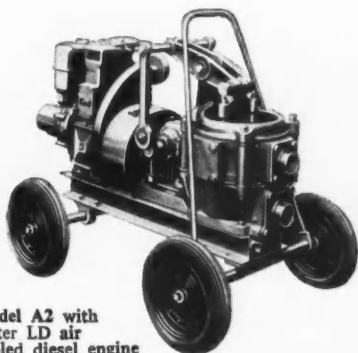
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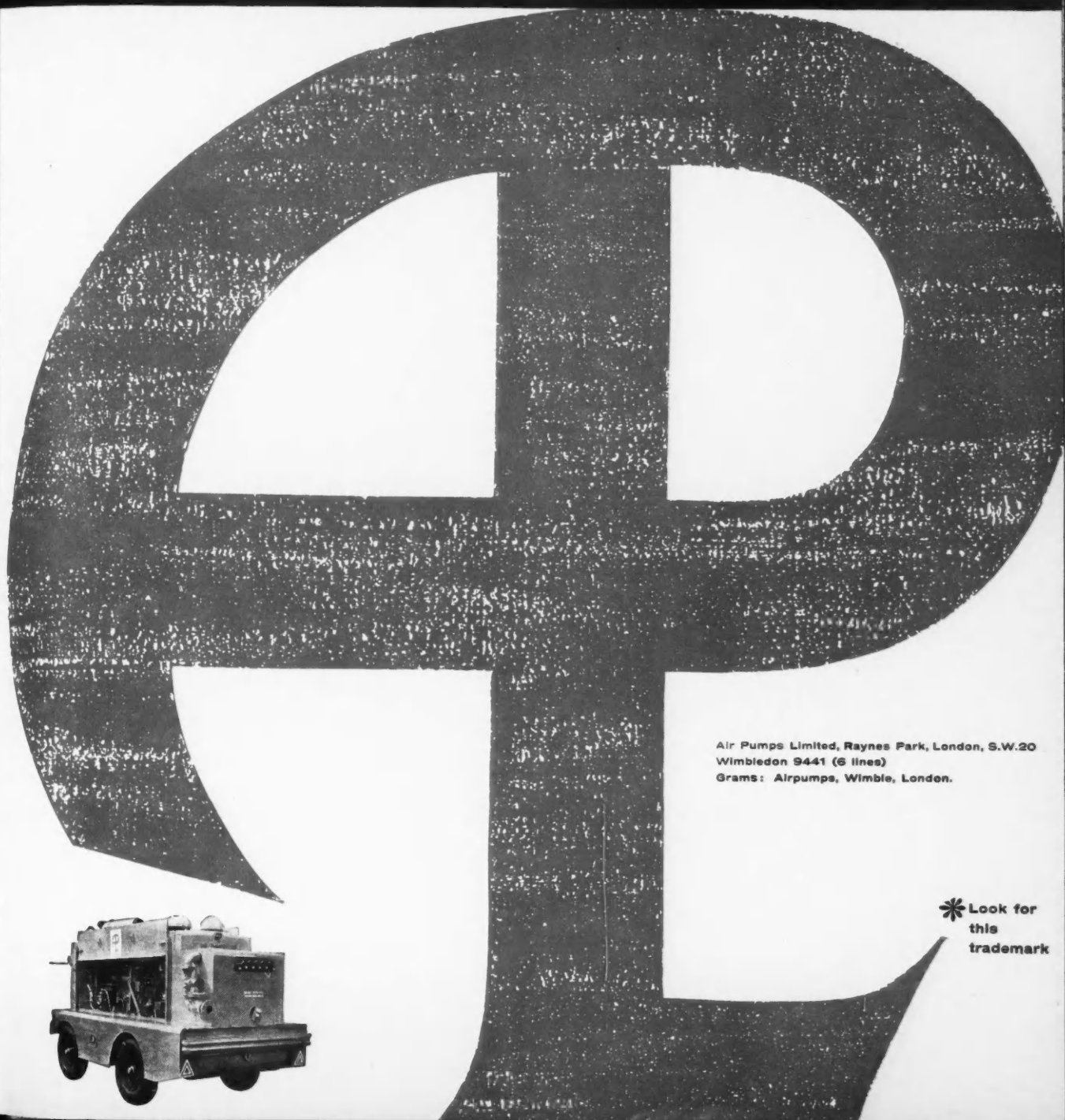
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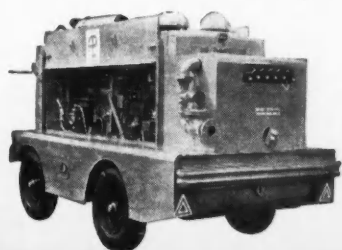
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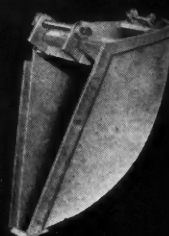
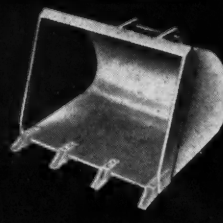
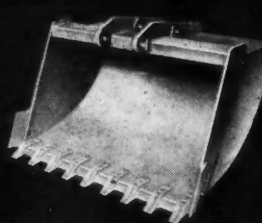
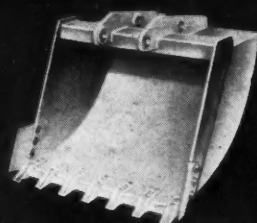
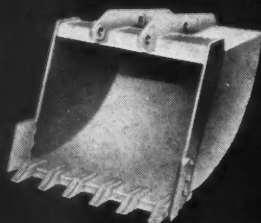
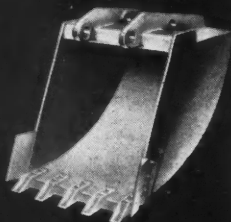
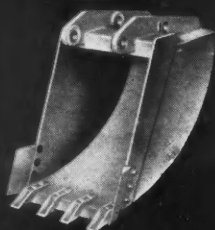
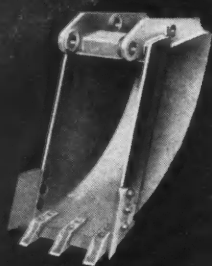


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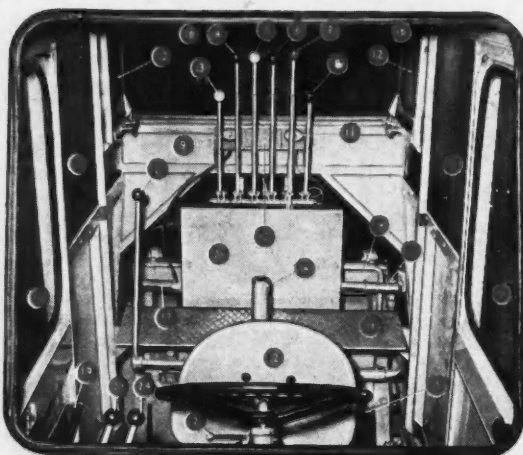
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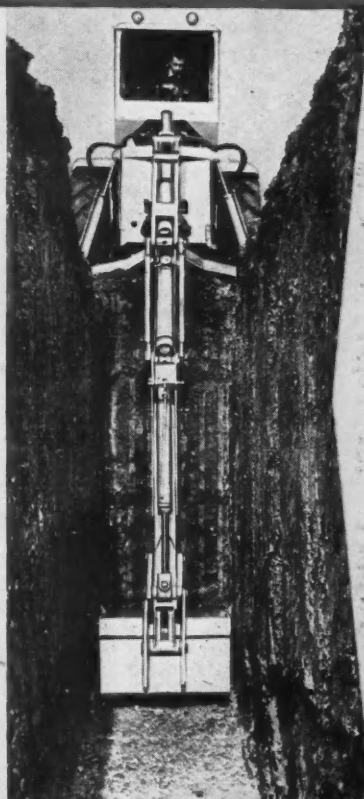
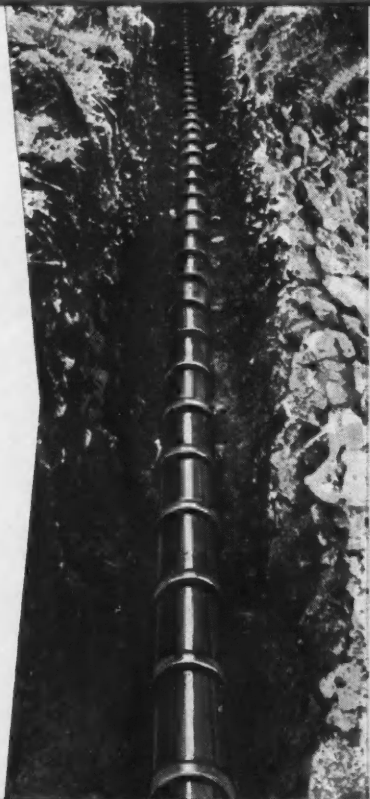
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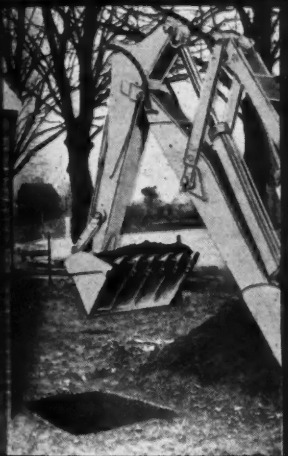
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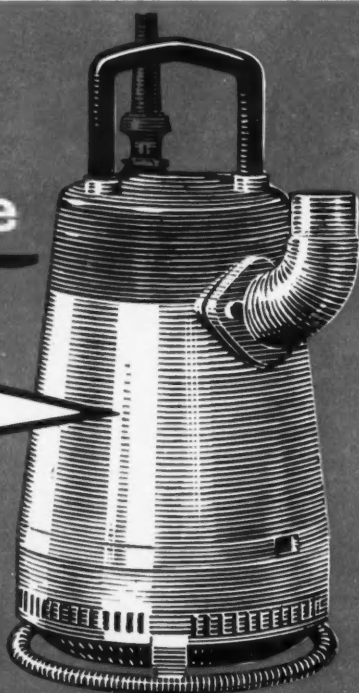


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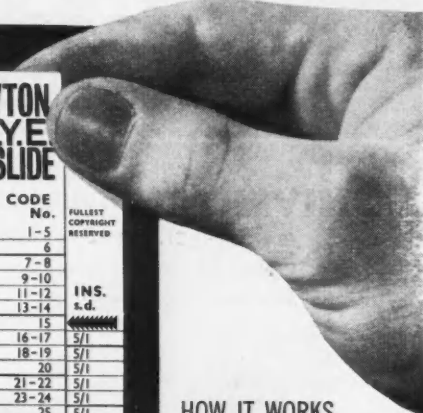


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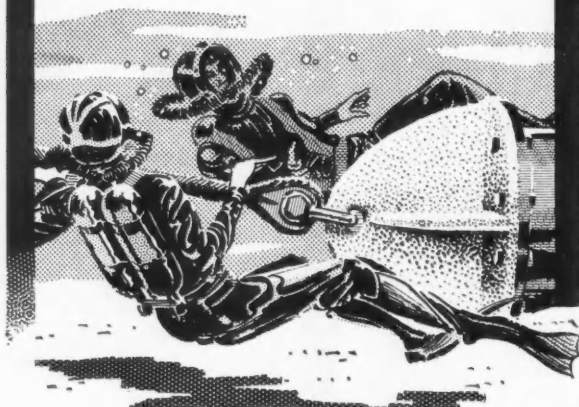
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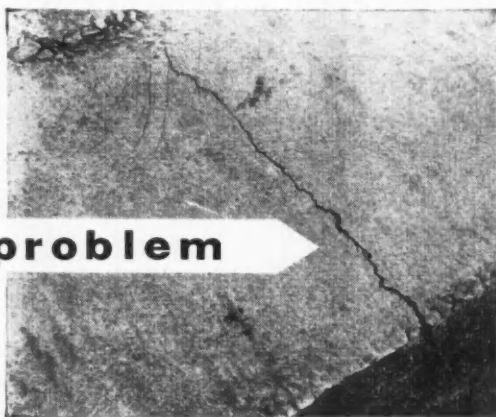
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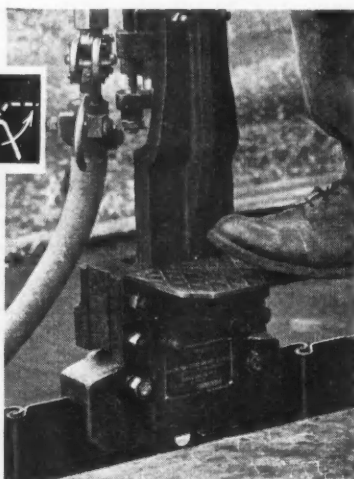
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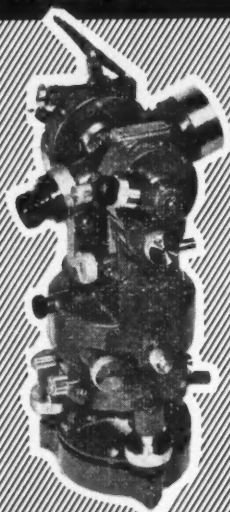
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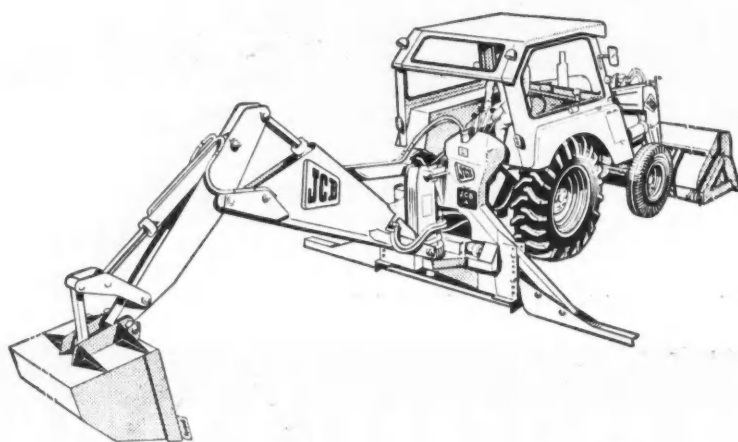
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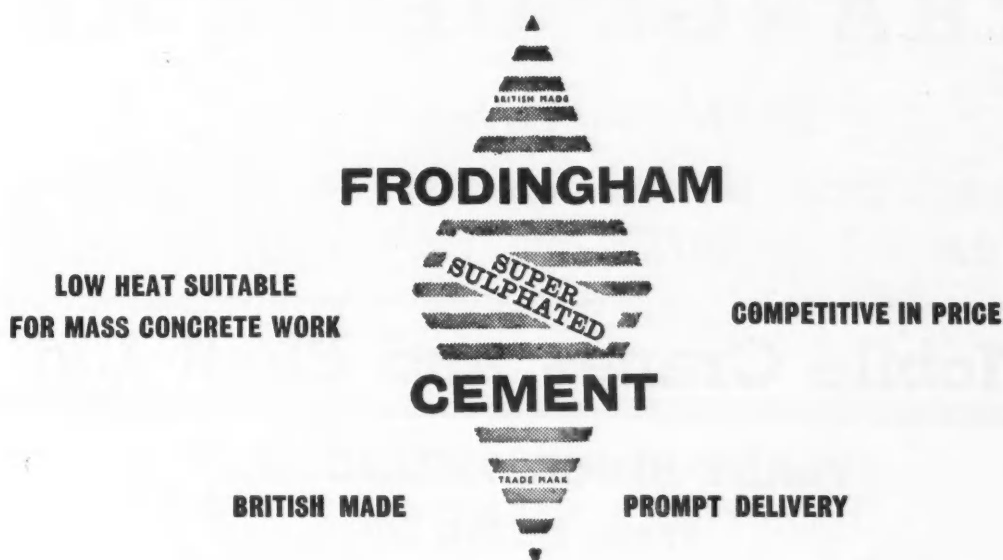
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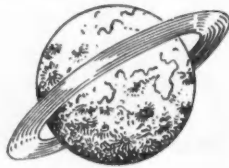
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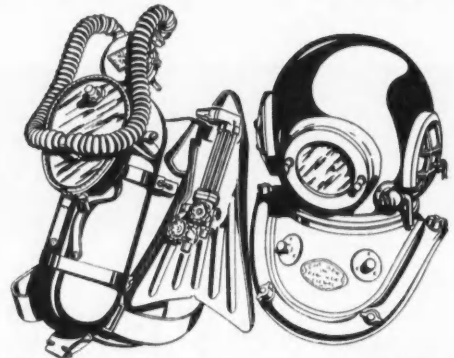
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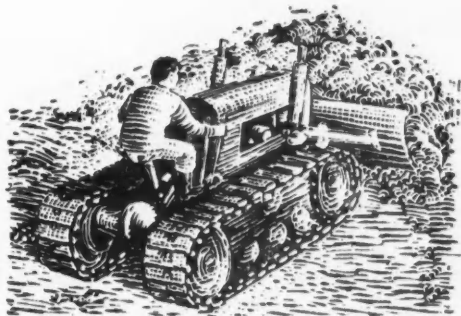
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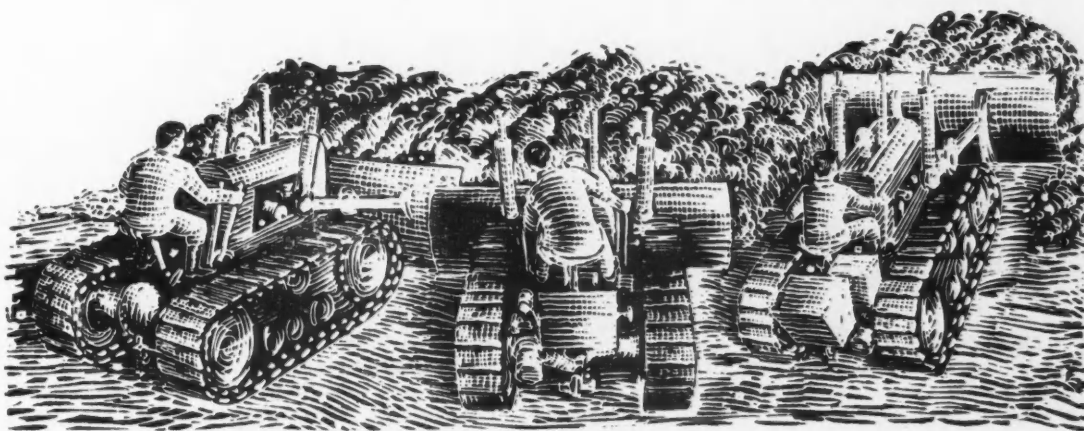


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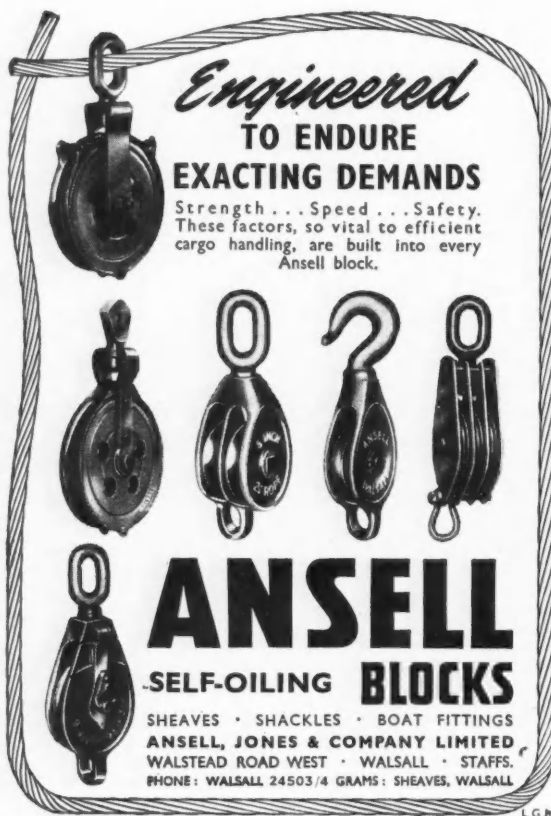
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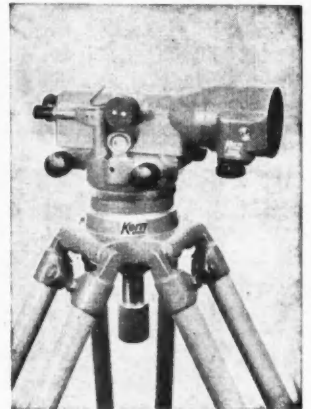
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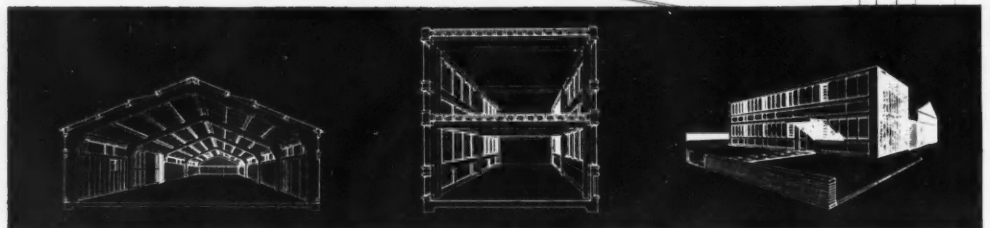
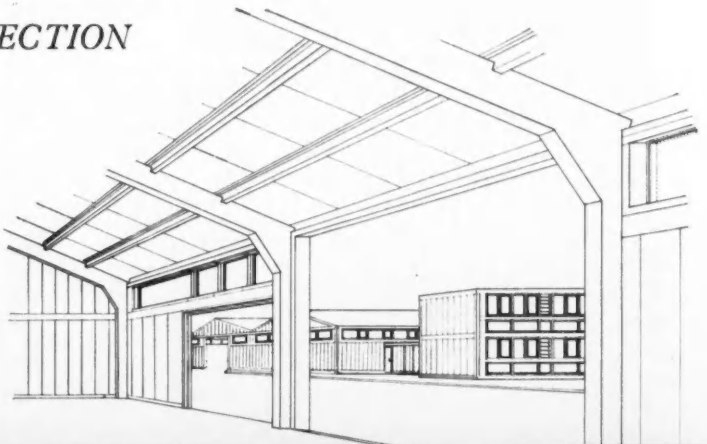
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ST. IVES SAND AND GRAVEL CO., LTD., 22 The Broadway, St. Ives, Hunts. (Tel.: St. Ives 2441/2/3/4.) (See Huntingdonshire for details.)

HOVERINGHAM GRAVELS, LTD., Hoveringham, Nottingham. (Tel.: Lowdham 3171—15 lines.) (For details, see Nottinghamshire.)

WEBB, G. CAMBRIDGE, 35 Magrath Ave., Cambridge. (Tel.: 59966, 53969, 50353 (night).) (See Cambs.)

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BENGRIY AND SONS, LTD., Longmoor, Kingsland, Gloucester. (Tel.: Kingsland 301/4.) (See details under Herefordshire.)

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CONTRACTORS' GUIDE TO AGGREGATES

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HAMPSHIRE

BARDON HILL QUARRIES (ELLIS AND EVERARD), LTD., near Leicester. (Tel.: Coalville 1226/7/8; or London: Vigilant 2530.) (For details, see Leics.)
BULL BROS. & SONS LTD., 126A High Street, Winchester. (Tel.: 2264.) Concrete aggregates (reconstituted, pit-mixed, weighbatched to meet any specification); also ballast, hoggins, path gravel and sand from own pits at Fawley, Lockerley, Ringwood, Romsey, Sway and Totton.

DANGERFIELD, F. J. AND CO. LTD., 261A Finchley Road, London, N.W.3. (Tel.: HAMstead 8044/8.) For all road aggregates, kerbs, setts. (See London.)
HALL AND CO. LTD., Baltic Wharf, Marine Parade, Southampton (Tel.: Southampton 21234), and at Portsmouth. Pits at Ringwood, Highbridge and Fawley. Gravel aggregate, concreting, plastering and building sand.

HASKINS, G. AND SONS, Queen Street, Emsworth. For washed sand and graded aggregates, path and road gravels, hoggins, clinker, ashes. (Tel.: Emsworth 2271.)

HOVERINGHAM GRAVELS, LTD., Hoveringham, Nottingham. (Tel.: Lowdham 3171-15 lines.) (For details, see Nottinghamshire.)
MOREYS (VERWOOD), LTD., Verwood, Wimborne, Dorset. (Tel.: Verwood 234.) Concrete aggregates, building sand, hoggins, path gravel.

NEW MILTON SAND AND BALLAST CO., Lynton, Devon, New Milton, Hants. (Tel.: 37 and 566.) Guaranteed crushed, washed, screened and graded concrete aggregates. All sizes. Washed sharp and fine sands.

PRIVETT, W. G. AND SONS, LTD., Drayton Lane, Portsmouth. (Tel.: Cosham 70059.) Concrete aggregates, building sand, hoggins, ashes, washed and graded filter media, etc.

RALPH OF BASINGSTOKE, LTD., 37 Kempsott Lane, Basingstoke, Hants. (Tel.: 85.) Concrete aggregates, building sand, path gravel, hoggins, etc.
TWICKENHAM GRAVEL CO., LTD., Ship Lane, Farnborough (Tel.: 1126); Sandhurst Road, Yateley (Tel.: 2230).

WESSEX SAND AND GRAVEL CO., 126 Hillside Avenue, Southampton. (Tel.: 56616.) Pits at Romsey and Gosport. Concrete aggregates, hoggins, building sand, etc.

HEREFORDSHIRE

BENGRY AND SONS, LTD., Longmow, Kingsland, Leominster, Herefordshire. (Tel.: Kingsland 301/4.) Suppliers of all grades of crushed concrete aggregates, road metallising, pitching stone, hardcore and coated macadam.

CLEE HILL TRANSPORT AND ROLLING CO., LTD., Ludlow, Salop. (Cleehillstone 284.) (See Shrops.)
HOVERINGHAM GRAVELS, LTD., Hoveringham, Nottingham. (Tel.: Lowdham 3171-15 lines.) (For details, see Nottinghamshire.)

NASH ROCKS STONE AND LIME CO., LTD., Presteigne, Radnor. (Tel.: Presteigne 352.) All grades of tanned and bituminous macadam, roadstone, chippings and concrete aggregates, etc.

OLD RADNOR TRADING CO., LTD., Kingston (Tel.: 421.) Granite and limestone aggregates coated macadam, concrete products.

SALOP SAND AND GRAVEL SUPPLY CO., Admaston, Wellington (Tel.: 961.) Salop.

SHAKEMATE QUARRY CO., LTD., Cinderford, Glos. (Tel.: Cinderford 3197.) "Doura" Facing, Engineering and Common Bricks in terra-cotta, red and golden brown. Concrete aggregates, roadstones, and Dolomitic media.

WHITECLIFF QUARRIES AND BRICKWORKS, LTD., Coleford, Glos. (Tel.: 3158/9.) (See Gloucestershire.)

HERTFORDSHIRE

BARDON HILL QUARRIES (ELLIS AND EVERARD), LTD., near Leicester. (Tel.: Coalville 1226/7/8; or London: Vigilant 2530.) (For details, see Leics.)
DANGERFIELD, F. J. AND CO. LTD., 261A Finchley Road, London, N.W.3. (Tel.: HAMstead 8044/8.) For all road aggregates, kerbs, setts. (See London.)

EASTWOODS SALES LTD., Eastwood House, City Road, E.C.1. (Tel.: Clerkenwell 2040.) Broxbourne pit. (Tel.: Hoddesdon 2456.) Producers and distributors of all grades of washed aggregates.

GABRIEL, C. LTD., Palmers Lane, Enfield, Middx. (Tel.: HOWard 4351/2/3.) Washed aggregates and building sand. Pits at Hertford and Enfield.

HALL AND CO. LTD., Railway Yard, Orchard Road, Stevenage. (Tel.: 775.) and at Hatfield. Gravel aggregates, concreting, plastering and building sand.

HARTIGAN, G. F. X. LTD. (See Buckinghamshire.)
ST. IVES SAND AND GRAVEL CO. LTD., 22 The Broadway, St. Ives, Hunts. (Tel.: St. Ives 2441/2/3/4.) (See Huntingdonshire for details.)

TWICKENHAM GRAVEL CO., LTD., Eleanor Cross Road, Waltham Cross. (Tel.: 23386.)

WEBB, G. CAMBRIDGE, 35 Magrath Ave., Cambridge. (Tel.: 59966, 53969, 50353 (night).) (See Cambs.)
WINFIELD HENRY, LTD., Pix Farm Lane, Hemel Hempstead, Herts. (Tel.: Berkhamsted 1208/9.) Pits at Hemel Hempstead, Watford, West Hyde, Rickmansworth. Concrete aggregates, hoggins, building sand.

HUNTINGDONSHIRE

BARDON HILL QUARRIES (ELLIS AND EVERARD), LTD., near Leicester. (Tel.: Coalville 1226/7/8; or London: Vigilant 2530.) (For details, see Leics.)
FERRERS AND AGGREGATES, LTD., Northampton Road Quarries, Rushden (2354/5). (See Northants.)

GRAVEL PRODUCTS (HUNTS), LTD., Little Paxton, St. Neots, Hunts. (Tel.: St. Neots 308.) Pits at Little Paxton, St. Neots, Hunts; and Blunham, Beds.

HOVERINGHAM GRAVELS, LTD., Hoveringham, Nottingham. (Tel.: Lowdham 3171-15 lines.) (For details, see Nottinghamshire.)

NENE BARGE AND LIGHTER CO., LTD., Market Chambers, Peterborough (Tel.: 5334/5), and Ship End Quarries, Wansford, near Peterborough (Tel.: Wansford 384/5.) Roadstone, hardcore, broken stone, ballast, ashes, silica clay and sand.

ST. IVES SAND AND GRAVEL CO., LTD., 22 The Broadway, St. Ives, Hunts. (Tel.: St. Ives 2441/2/3/4.) Producers of all grades of washed sand and gravel. Ready mixed concrete. Precast concrete of every description.

HUNTINGDONSHIRE

WEBB, G. CAMBRIDGE, 35 Magrath Ave., Cambridge. (Tel.: 59966, 53969, 50353 (night).) (See Cambs.)

KENT

BRASTED SAND PITS, Brasted, Kent. (Tel.: 586.) London Office: 10A Elly Street, S.E.15. (Tel.: New Cross 333.) Soft and plastic sand, shingle, lime and sand-mix dry, hardcore, S.H. bricks, ashes, etc.

BROWN BROS. (SITTINGBOURNE), LTD., Chalkwell Road, Sittingbourne, Kent. (Tel.: Sittingbourne 330.) Sand, ballast, shingle, hoggins, hardcore, clinker, chalk, etc.

CLUBB, J. LTD., Dartford, Kent. (Tel.: Dartford 25431.) Pits in North Kent, Medway area and Sevenoaks district. All washed and crushed gravel aggregates, concreting and building sand.

DIAMOND TREAD CO. (1938), LTD., Diston Court Quarry, Larkfield, near Maidstone. (Tel.: West Malling 3444.) Quarry owners, tarmacadam, bituminous macadam, and dry road stone manufacturers and suppliers. Head Office: 21-22 Old Bailey, London, E.C.4. (Tel.: City 7001-10 lines.)

DIAMOND TREAD CO. (CHART), LTD., Swar Lane Quarries, Little Chart, Ashford, Kent. Quarry owners; tarmacadam, bituminous macadam and dry roadstone suppliers. All inquiries to Area Office: Diston Court Quarry, Larkfield, near Maidstone, Kent. (Tel.: W. Malling 3444.)

HALL AND CO. LTD., Canning Street, Maidstone. (Tel.: Maidstone 211.) and at Folkestone and Hayes. Pits at Lunsford, near Larkfield, Riverhead. Gravel aggregates, concreting, plastering and building sand, Surecrete precision-mixed concrete.

HARRIS, M. P. AND CO. LTD., Ashford, Kent. Paddock Wood, Kent. (Tel.: 385.) (See Sussex.)
TILBURY CONTRACTING AND DREDGING CO., LTD., Postley, Maidstone. (Tel.: Maidstone 5541/2/3.) Suppliers of tanned, bituminous and dry Kentish ragstone, sea walling, asphalt fillers, Scotch granite and kerbing.

LANCASHIRE

BROOMBYS, LTD., Sandside, Milnthorpe. (Tel.: 251/2.) Westmorland. (See Westmorland.)
BUCKTON QUARRY, Broken stone, all grades. (Tel.: Mossley 123.) Or write Main Road, Oldham.

CASTLETON SAND AND GRAVEL QUARRIES, LTD., Crown Lane, Castleton, near Rochdale. (Tel.: Castleton 57100.) Lee Quarries, Bacup. (Tel.: Bacup 287.) Washed pit sand, crushed washed aggregates, pitching stone.

CROXSON GRAVEL, LTD., Cheadle, Stoke-on-Trent. Staffs. (Tel.: Tean 393.) Manchester Office: Blackfriars 7366/7. Plant capacity, 2,000 tons per day.

DUNNING AND SON, LTD. (See Shropshire.)
HARTLEY, JOHN W., LTD., Lundeshill Quarry, Carnforth, Lancs. (Tel.: Carnforth 100.) Large producers of highest quality washed sands, clean washed natural pebble and crushed gravel aggregates for all construction purposes.

HILTON GRAVEL LTD., Rice Street, Liverpool Road, Manchester, 3. (Tel.: Deansgate 5455 and 5456.) Quarries at Cheadle, Staffs. (Tel.: Tean 241.) And at Lostock, near Denton, Lancs. (Tel.: Longton 32106.)

HOVERINGHAM GRAVELS, LTD., Hoveringham, Nottingham. (Tel.: Lowdham 3171-15 lines.) (For details, see Nottinghamshire.)

HULLMAN GRAVEL LTD., Cheadle, Stoke-on-Trent. (Tel.: Cheadle 2323/4, 2119 and 2195.) Manchester Office: 464 Wilbraham Road, Chorlton, Manchester, 21. (Tel.: Chorlton 2274/5.)

KELMAG LTD., 54 Denmar Road, Preston, Lancashire. (Tel.: Preston 84688/9.) Bituminous, tanned and waterbound macadam. Dry roadstone, sized and graded limestone aggregates. All to B.S. and M. of T. Specifications.

PENMAENMAWR AND WELSH GRANITE CO., LTD., all sizes and gradings of crushed granite aggregate. Liverpool and Preston Depots:

Office: 7 Picton Road, Liverpool, 15.
 (Tel.: Seton Park 7261.)
 Manchester Depot:

Office: Cornbrook Road, Manchester, 15.
 (Tel.: Trafford Park 3830.)

TERN HILL SAND AND GRAVEL CO., LTD., Alington Quarries, near Market Drayton, Staffs. (Tel.: Hales 261/2/3.) (See Staffs. for details.)

TRENTON GRAVELS, LTD., Lordsley Quarries, Willoughbridge, near Market Drayton, Salop. (Tel.: Pipe Gate 304/5.) All sizes crushed or natural washed gravel. Twice washed sharp concrete sand. Plastering sand. Plant capacity: 2,000 tons per day.

WITHERS LIMESTONE, LTD., Black Lane Quarry, Carnforth. (Tel.: Carnforth 327.) Graded limestone aggregate to B.S., all sizes. Immediate delivery ex stock.

X.L. GRANITE (INGLETON), LTD., Head Office: Clapham, via Lancaster. (Tel.: Clapham 318/9.) Works Tel.: Ingleton 251. All sizes and gradings of Ingleton granite aggregate.

LEICESTERSHIRE

BARDON HILL QUARRIES (ELLIS AND EVERARD), LTD., near Leicester. (Tel.: Coalville 1226/7/8; or London: Vigilant 2530.) (For details, see Leics.)

CLIFFE HILL GRANITE CO., LTD., Markfield, near Leicester. (Tel.: Markfield 561/2/3.) Granite aggregates to B.S. all sizes. Tanned and bituminous granite concrete plants and kerbs. Transit-mixed concrete.

DUSTON STONE QUARRIES, LTD., New Duston, Northampton. (Tel.: Brixworth 278 and 298; Duston 505.) (See Northamptonshire.)

ENDERBY AND STONEY STANTON GRANITE CO., LTD., 21 New Walk, Leicester. (Tel.: 20891.) Quarries at Enderby. London Office: 29 Dorset Square, N.W.1. (Tel.: Amb. 1141.)

HILTON GRAVEL, LTD., Hemington Fields, near Clapham, via Lancaster. (Tel.: Clapham 318/9.)

HOVERINGHAM GRAVELS, LTD., Hoveringham, Nottingham. (Tel.: Lowdham 3171-15 lines.) (For details, see Nottinghamshire.)

MOUNTSOREL GRANITE CO., LTD., 21 New Walk, Leicester. (Tel.: 20891.) Quarries at Mountsorel, near Loughborough. In pink granite a speciality. London Office: 29 Dorset Sq., N.W.1. (Amb. 1141.)

WALNIP GRAYELS, LTD., Wainip Road, Syston, Leicester. Any size or grading, scientifically balanced ballast. All to B.S. (Tel.: Syston 2327 and 2797.)

WREAKE VALLEY GRAVELS CO., LTD., Melton Mowbray. (Tel.: Pit-Rotherby 205 or head office Melton 2488.) All grades washed aggregates and sand, transit mixed concrete.

LINCOLNSHIRE

CONINGSBY SUPPLY CO., LTD., Registered Office: The Broadway, Woodhall Spa, Lincs. (Tel.: Woodhall Spa 2322.) Screened limestone, hardcore, pitching, filling, flint, hoggins. Ex quarries or delivered.

DOW-MAC (PRODUCTS), LTD., Tallington, Stamford. All grades of washed sand and gravel. (Tel.: Market Deeping 2301.)

EAST MIDLANDS BUILDERS' SUPPLY CO., 21 Castle-dyke West, Barton-on-Humber, Lincs. (Tel.: Barton 2189.) All grades washed sand and gravel, roadstone, hardcore, washed silica sand.

GIBBONS, F. B. AND SONS, LTD., Registered Office: Welby House, Market Deeping, near Peterborough. (Tel.: Market Deeping 3321/2363.) Pits at Langtolt, near Peterborough. (Tel.: Market Deeping 2210.) All grades washed sand and aggregates.

HARTSHOLME GRAVEL AND SAND CO., LTD., Hartsholme Wood, Doddington Road, Lincoln. Sole selling agents: Hartsholme Sales, Ltd., 17 West Parade, Lincoln. (Tel.: Lincoln 23391.)

HOVERINGHAM GRAVELS, LTD., Hoveringham, Nottingham. (Tel.: Lowdham 3171-15 lines.) (For details, see Nottinghamshire.)

PETERSBOROUGH QUARRIES, LTD., Sandylands, Maxey, Peterborough. (Tel.: Market Deeping 2355-3 lines.) Quarry at Ropsley, all grades of hardcore and broken stone. (See also Northants.)

POLLARD, C. AND SON (TALLINGTON), LTD., Wolk House, Langtolt, Peterborough. Pits at Tallington, near Stamford, Lincs. (Tel.: Market Deeping 2140.) All grades washed sand and aggregates. For Supercrete ready mixed concrete, phone Market Deeping 3152.

TRENTFORD GRAVELS, LTD., Head Office: Deansgrove, Grimsby. (Tel.: Grimsby 5354.) Washed and graded gravel and sand, roadstone, hardcore, slag, tarmac, ashes, etc. Pits and quarries throughout the county.

LONDON

BARDON HILL QUARRIES (ELLIS AND EVERARD), LTD., near Leicester. (Tel.: Coalville 1226/7/8; or London: Vigilant 2530.) (For details, see Leics.)

BUCKRICKS COMPANY, LTD., 57 Piazza Chambers, Covent Garden, London, W.C.2. (Tel.: Covent Garden 0534.) All grades of washed aggregates, sand, building sand, asphalt, grit. Sterilised dry sand accurately graded to buyers' requirements.

COX, H. AND SONS, LTD., 33 Southampton Way, Lamberwell, S.E.5. (Tel.: Rodney 2215-3 lines.)

DANGERFIELD, F. J. AND CO., LTD., 261A Finchley Road, N.W.3. (Tel.: HAMstead 8044-8.) Granite limestone or slag, coated or dry, all sizes and pitching, and granite and concrete aggregates and other minerals by road or rail, or ex London stock.

DORSET LIMESTONES, LTD., Bumpers Lane, Easton, Portland, Dorset. (Tel.: Portland 2207/8.) (For details, see Dorset.)

DRINKWATER, W. W. (WILLESDEN), LTD., Dudden Hill Lane, Willesden, N.W.10. (Tel.: GLadstone 6400/5.) Pits: Rush Green, Denham, Bucks. (Tel.: Denham 2241/2/3.) Also Staines Road, Hounslow Heath, Middlesex. (Tel.: Hounslow 6222/3.)

GABRIEL, C. LTD., Palmers Lane, Enfield, Middx. (Tel.: HOWard 4351/2/3.) Washed aggregates and building sand. Pits at Enfield and Hertford.

GREENHAM SAND AND BALLAST CO., LTD., Chertsey Road, Feltham. (Tel.: Feltham 2285/7.) Pits at Hounslow, Feltham and Staines. Concrete aggregates, plastering and building sand.

ALL AND CO., LTD., Chantry House, Eccleston Street, S.W.1. (Tel.: Sloane 7122.) and at East Dulwich, Poplar and Wandsworth. Gravel aggregate, concreting, plastering and building sand.

HARTIGAN, G. F. X. LTD., Washed sharp sand to B.S. 882. (See Buckinghamshire.)

KEEN, W. J. AND SONS, 18 Granville Road, Epping, Essex. (Tel.: Epping 2520.) All sands, ballasts, shingle and hardcore.

LONDON BALLAST CO., LTD. (Tel.: Paddington 5064.) 55A Porchester Terrace North, Paddington, W.2.

READ, P. T. LTD., Gales Gardens, Bethnal Green, E.2. (Tel.: Shoreditch 9128/9.) All sands, ballast and shingles supplied and delivered; also ready mixed concrete. Pits: Fairlop Airfield, Forest Road, Ilford, Essex. (Tel.: Hainault 6111/2/3.)

SHAKEMATE QUARRY CO., LTD., Cinderford, Glos. (Tel.: Cinderford 3197.) "Doura" Facing, Engineering and Common Bricks in terra-cotta, red and golden brown. (See Glos.)

MERIONETHSHIRE

SALOP SAND AND GRAVEL SUPPLY CO., Admaston, Wellington. (Tel.: 961.) Salop.

MIDDLESEX

CROSS, GEO. C. AND CO., LTD., Uxbridge Road, Southall. (Tel.: Southall 2264/5/6.) Concrete aggregates, hardcore, excavations, demolitions.

DRINKWATER, W. W. (WILLESDEN), LTD., Staines Rd., Hounslow Hth., Middx. (Hounslow 6222/3.)

GABRIEL, C. LTD., Palmers Lane, Enfield, Middx. (Tel.: HOWard 4351/2/3.) Washed aggregates and building sand. Pits at Enfield and Hertford.

GREENHAM SAND AND BALLAST CO., LTD., Chertsey Road, Feltham. (Tel.: Feltham 2285/7.) Pits at Hounslow, Feltham and Staines. Concrete aggregates, plastering and building sand.

GRUNDON, S., 100/104 Harrington Road, Hillingdon, Middlesex. (Tel.: Uxbridge 36511/2/3.) Sand, ballast, shingle, hardcore, ashes, excavation and demolition.

HALL AND CO. LTD., Chantry House, Eccleston Street, S.W.1. (Tel.: Sloane 7122.) and at Ashford and Brentford. Gravel aggregates, concreting, plastering and building sand.

LONDON BALLAST CO., LTD. (Tel.: Paddington 5064.) 55A Porchester Terrace North, Paddington, W.2.

TWICKENHAM GRAVEL CO., LTD., Feltham Hill Road, Hanworth. (Tel.: Feltham 2638.)

READ, P. T. LTD., Gales Gardens, Bethnal Green, E.2. (Tel.: Shoreditch 9128/9.) All sands, ballast and shingles supplied and delivered; also ready mixed concrete. Pits: Edmondton Gravel Pit, Montagu Road, N.9. (Tel.: Shoreditch 9128/9.)

STUART MACLEY, LTD., Gordon Rd., High Wycombe. (Tel.: High Wycombe 2591/2.)

CONTRACTORS' GUIDE TO AGGREGATES

MID-WALES

BENGRI AND SONS, LTD., Longmoor, Kingsland, Leominster, Herefordshire. (Tel.: Kingsland 301/4.) (See details under Herefordshire.)

NASH ROCKS STONE AND LIME CO., LTD., Presteigne, Radnor. (Tel.: Presteigne 352.) (See Herefordshire for details.)

OLD RADNOR TRADING CO., LTD., Quarries in Radnorshire. (Tel.: Kingston 421.) (See Herefordshire.)

SALOP SAND AND GRAVEL SUPPLY CO., Admaston, Wellington (Tel. 961), Salop.

TERN HILL SAND AND GRAVEL CO., LTD., Almington Quarries, near Market Drayton, Staffs. (Tel.: Hales 261/2/3.) (See Staffs. for details.)

MONMOUTHSHIRE

MONMOUTHSHIRE ASSOCIATED QUARRIES, LTD., Head Office: 38 Chestow Road, Newport, Mon. (Tel.: Newport 58311/2.) Suppliers of all grades of concrete aggregates, road metal, pitching stone, tarmacadam and bituminous macadam in limestone, dolomite and blue pennant stone. Quarries throughout the county.

SHAKEMANTLE QUARRY CO., LTD., Cinderford, Glos. (Tel.: Cinderford 3197.) "Doura" Facing, Engineering and Common Bricks in terra-cotta, red and golden brown. (See Glos.)

WHITECLIFF QUARRIES AND BRICKWORKS, LTD., Cleford, Glos. (Tel. 3158/9.) (See Gloucestershire.)

MONTGOMERYSHIRE

NASH ROCKS STONE AND LIME CO., LTD., Presteigne, Radnor. (Tel.: Presteigne 352.) (See Herefordshire for details.)

SALOP SAND AND GRAVEL SUPPLY CO., Admaston, Wellington (Tel. 961), Salop.

NORFOLK

BARDON HILL QUARRIES (ELLIS AND EVERARD), LTD., near Leicester. (Tel.: Coalville 1226/7/8; or London: Vigilant 2530.) (For details, see Leics.)

JOHNSON, P. C. H., LTD., Station Road, Terrington St. Clement, near King's Lynn. (Tel.: Terrington St. Clement 248.) Washed and screened gravel, roadstone, washed sharp and fine sands.

ST. IVES SAND AND GRAVEL CO., LTD., 22 The Broadway, St. Ives, Hunts. (Tel.: St. Ives 2441/2/3/4 and Cony Weston 12.) Pits at St. Ives and Knettishall, near Thetford.

SNETTERTON STONE QUARRIES, LTD., Pix Farm Lane, Hemel Hempstead, Herts. (Tel.: Berkhamstead 1208/9.) Pits at Snetterton. Concrete aggregates, building sand.

THORPE GRAVEL PITS, LTD., Harvey Lane, Norwich. (Tel.: Norwich 33243/4.) Washed and graded aggregates, stone and gravel delivered to all parts of Norfolk and Suffolk.

NORTHAMPTONSHIRE

BARDON HILL QUARRIES (ELLIS AND EVERARD), LTD., near Leicester. (Tel.: Coalville 1226/7/8; or London: Vigilant 2530.) (For details, see Leics.)

BICESTER STONE CO., LTD., Stratton Audley, Bicester, Oxon. (Tel.: Stratton Audley 391/2.) Manufacturers and suppliers of all grades limestone, tarmacadam, dry, pitching stone, hardcore, etc.

BILLING GRAVEL CO., LTD., Station Road, Billing, Northampton. (Tel.: Cogenhoe 219.) London Office: 23 Berkeley Square, W.1. (Tel.: Mayfair 6341.)

BRAYBROOK, E. W., LTD., Newton Road, Higham Ferrers, Northants. (Tel.: Rushden 3344 and 3345.) All grades of washed and graded aggregates to B.S.S., building sand, hardcore.

DOW-MAC (PRODUCTS), LTD., Tallington, Stamford. All grades of washed sand and gravel. (Tel.: Market Deeping 2301.)

DUSTON STONE QUARRIES, LTD., New Duston, Northampton. (Tel.: Brixworth 278 and 298; Duston 505.) Producers of building and walling stone roadstone, hardcore, broken stone, ashes, sand, gravel and hoggins. Immediate delivery throughout Northamptonshire.

FERRERS AND AGGREGATES, LTD., Northampton Road Quarries, Rushden, Northants. (Tel.: Rushden 2354/5.) Largest producers in the county of all grades of high-quality concrete aggregate to B.S.S. Deliveries throughout Northamptonshire and adjoining counties.

GIBBONS, F. B. AND SONS, LTD., Welby House, Market Deeping, Peterborough. (Tel.: Market Deeping 3321/2383.) (See Lincolnshire for details.)

HOVERINGHAM GRAVELS, LTD., Hoveringham, Nottingham. (Tel.: Lowdham 3171—15 lines.) (For details, see Nottinghamshire.)

KETTON STONE CO. (Prop. Andrew's Garage), Ketton, near Stamford. (Tel.: Ketton 206.) Hardcore, roadstone, crushed stone, top soil, silica clay. Quarries at Ketton.

MACKANESS, A. J., LTD., Ransome Road, Northampton. (Tel.: Northampton 589.) Producers of all grades of washed aggregates. Building sand. Mixmortar (lime/sand mortar). Promot deliveries.

NENE BARGE AND LIGHTER CO., LTD., Market Chambers, Peterborough (Tel. 5534/5), and Ship End Quarries, Wansford, near Peterborough (Tel.: Wansford 384/5). Roadstone, hardcore, broken stone, ballast, ashes, silica clay and sand.

NEWARK (PETERBOROUGH) SAND AND GRAVEL CO., LTD., 127 Eastfield Road, Peterborough. (Tel.: Peterborough 6991.) All grades washed and screened gravel and sand.

PETERBOROUGH QUARRIES, LTD., Sandylands, Maxey, Peterborough. (Tel.: Market Deeping 2355.) Eight quarries supplying all grades of hardcore and broken stone. Also Wetmix at Yarewell, Wansford. All grades gravel and sand at Maxey.

POLLARD, C. AND SON (TALLINGTON), LTD., Walk House, Langtoft, Peterborough. (Tel.: Market Deeping 2140.) (See Lincolnshire for details.)

STORTON, F. E., LTD., Weedon Road, Northampton. (Tel.: Northampton 3359.) Producers of washed gravel and sand to B.S.S.

NORTH WALES

CAWOOD, WHARTON AND CO., LTD., Pistyll Gwyn Quarry, Llanarmon, near Mold. (Tel.: Llanarmon-yn-Ial 27.) Crushed limestone and tarred macadam, all grades.

CHESHIRE AND NORTH WALES TARRED MACADAM CO., LTD., Llanarmon, near Mold. (Tel.: Llanarmon-yn-Ial 43.) Hard, broken limestone; dry and coated to B.S.S. Inquiries to Registered Office—Market Chambers, Tower Square, Tunstall, Stoke-on-Trent. (Tel.: Stoke-on-Trent 88094.)

ENSTON BROS., Llwyn Isaf Quarry, Clynogfawr, Caernarvon. (Tel.: Clynogfawr 297/8.) All sizes crushed, washed natural sand and gravel. Highest quality. Precast concrete products, ex our Griffiths Factory, Caernarvon. (Tel.: Caernarvon 2535/6.) Crushed granite ex our quarry, Pengwern and Gwydyr Quarries, Ltd., Trefriw, Llanwrst, Denbighshire. (Llanwrst 36.)

PENMAENMAWR AND WELSH GRANITE CO., LTD., Quarries at Penmaenmawr (Tel. 2256/8), and at Trevor (Tel.: Clynogfawr 223), Caernarvonshire. All sizes and gradings of crushed granite aggregate. Any quantity per day; immediate delivery ex stock. Coated granite also available.

RUTHIN AND DENBIGH TARMACADAM CO., LTD. (a member of the Lunt, Comley and Pitt Group), Denbigh (Tel.: Denbigh 75.) Lime, limestone, carbonate of lime, tarmacadam, etc. Also inquiries to Lunt Bros., Ltd., Gazette Buildings, 168 Corporation Street, Birmingham (Tel.: Central 7408), and Lunt Bros., Ltd., Stourbridge (Tel. 5201—8 lines).

TERN HILL SAND AND GRAVEL CO., LTD., Almington Quarries, near Market Drayton, Staffs. (Tel.: Hales 261/2/3.) (See Staffs. for details.)

NOTTINGHAMSHIRE

AIZLEWOOD, DOUGLAS E., Bow Bridge, Rotherham. (Tel.: Rotherham 2622.) Crushed and graded limestone: all grades of washed gravel and sands.

BARDON HILL QUARRIES (ELLIS AND EVERARD), LTD., near Leicester. (Tel.: Coalville 1226/7/8; or London: Vigilant 2530.) (For details, see Leics.)

GLEN QUARRIES, LTD., Central Chambers, Wellgate, Rotherham. (Tel.: Rotherham 5223.) Crushed and graded stone, concreting sand, building sand, plastering sand and crushed gravel; could be collected ex quarry or delivered.

GUNTHORPE GRAVELS (1958), LTD. (Tel.: Nottingham 77357; and Works: Lowdham 2131.) (An associate company of T. C. Campbell, Ltd.) All grades washed gravel and sand to B.S.S.

HOVERINGHAM GRAVELS, LTD., Hoveringham, Nottingham. (Tel.: Lowdham 3171—5 lines.) Quarries at Hoveringham, Holme Pierrepont, Colwick, Bleasby and Newark. Other quarries throughout the country deliveries in 21 counties. All grades of washed gravel and sand to any specification. Crushed quartzite for surface dressing of roads a speciality. Combined plant capacity 20,000 tons per day.

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